

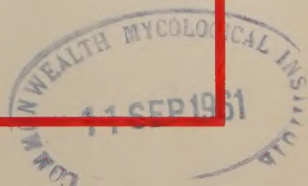
WYE COLLEGE

(University of London)

THE REPORT OF THE PRINCIPAL TO THE GOVERNING BODY

for the year 1959-60

1961



SIXTY-SEVENTH REPORT
FOR THE YEAR ENDED 30TH SEPTEMBER, 1960

**Governing
Body**

Since the last Report the following appointments have been made:

Representative Governors:

By the Senate of the University of London:

Professor T. A. Bennet-Clark
(*vice* Dr. J. R. Raeburn)

By and from the Academic Board of Wye College:

Dr. H. S. Darling
Dr. I. W. Selman
Professor R. L. Wain, F.R.S.
Dr. G. P. Wibberley

By the former students of Wye College and the former Horticultural College, Swanley:

Mr. B. S. Furneaux
Mrs. Frances Perry

Accounts

The audited accounts have been presented and copies furnished to all persons, corporations and bodies contributing to the revenue of the College.

J. W. KENNARD,

Clerk to the Governors.

11 Bank Street,
Ashford, Kent.

September 1960.

CHAIRMEN OF THE GOVERNING BODY

(1893-1960)

1893-1904	E. J. Halsey, Esq.
1905-1915	The Rt. Hon. Lord Ashcombe, P.C., M.A.
1916-1919	H. E. H. Rice, Esq.
1920-1925	The Rt. Hon. Laurence Hardy, P.C., M.A., D.L.
1926-1930	C. B. Edgar, Esq., D.L., B.Mus., B.Sc.
1931-1945	Sir Edward Hardy
1946-	The Rt. Hon. Lord Northbourne, B.A.

PRINCIPALS OF THE COLLEGE

(1894-1960)

1894-1902	A. D. Hall, Esq., M.A., F.C.S. (later Sir A. Daniel Hall, D.Sc., F.R.S.)
1902-1922	M. J. R. Dunstan, Esq., O.B.E., M.A., F.R.S.E., F.I.C.
1922-1940	R. M. Wilson, Esq., B.Sc., N.D.D.
1940-1945	V. R. S. Vickers, Esq. (<i>Acting</i>)
1945-	Dunstan Skilbeck, Esq., C.B.E., M.A.

WYE COLLEGE

VISITOR

His Grace The Lord Archbishop of Canterbury.

FELLOWS OF THE COLLEGE

Sir E. John Russell, O.B.E., D.Sc., F.R.S.
Sir Edward Hardy.
Mrs. R. J. Tabor, C.B.E., D.Sc., A.R.C.S.
Sir Ronald Hatton, C.B.E., M.A., D.Sc., F.R.S.
Geoffrey Mure, Esq., M.C., M.A., LL.D.
James Wyllie, Esq., O.B.E., B.Sc.
Professor C. D. Darlington, D.Sc., F.R.S.
Sir Edward Salisbury, C.B.E., D.Sc., LL.D., F.R.S., F.L.S.
Professor Sir James Scott Watson, C.B.E., M.C., LL.D., D.Sc.
Dr. Norah L. Penston, B.A., D.Phil.
Sir Geoffrey Nye, K.C.M.G., O.B.E., B.Sc.Agric.

GOVERNING BODY

The Governing Body consists of 32 members under the Chairmanship of The Lord Northbourne.

EX-OFFICIO GOVERNORS

*The Principal
*The Vice-Principal

REPRESENTATIVE GOVERNORS

Appointed by the Senate of the University of London:

Professor T. A. Bennet-Clark, M.A., Ph.D., F.R.S., F.L.S.,
King's College, London.
Miss Marian E. A. Bowley, Ph.D., University College, London.
Professor Dame Lillian Penson, D.B.E., Ph.D., D.Litt., LL.D.,
D.C.L., F.R.C.S., Bedford College, London.
*Professor H. H. Read, D.Sc., F.R.S.E., F.R.S., Royal School
of Mines, London.
Professor S. W. Wooldridge, C.B.E., D.Sc., F.R.S., King's
College, London.
W. R. Wooldridge, Esq., M.Sc., Ph.D., F.R.C.V.S., F.R.I.C.,
The Animal Health Trust, London.

Appointed by the Hebdomadal Council of the University of Oxford:

N. D. G. James, Esq., M.C., M.A., Old Town House, Nuneham
Courtenay, Oxfordshire.

Appointed by the Council of the Senate of the University of Cambridge:

R. G. Tomkins, Esq., M.A., Ph.D., Department of Scientific
and Industrial Research, Ditton Laboratory, Larkfield,
Kent.

Appointed by the Minister of Agriculture:

*E. Brundrett, Esq., Acton Farm, Charing, near Ashford.

Appointed by the Kent County Council:

*The Lord Brabourne, Newhouse, Mersham, near Ashford.

*Miss M. Maplesden Noakes, M.B.E., Long Rede, Barming,
Maidstone.

*The Lord Northbourne, B.A., Northbourne Court, Deal.

*G. T. Paine, Esq., M.B.E., J.P., The Grange, Lydd.

Appointed by the Surrey County Council:

C. Crowther, Esq., M.A., Ph.D., 79 Cheam Road, Ewell.

Colonel the Honourable C. G. Cubitt, D.S.O., T.D., D.T.,
High Barn, Effingham.

*T. Hilling, Esq., Prestons, Chobham.

Appointed by the Council of the Royal Horticultural Society:

H. V. Taylor, Esq., C.B.E., D.Sc., A.R.C.S., V.M.H., Preston
Grange, Barnet Road, Potters Bar, Middlesex.

*Appointed by the Kent Incorporated Society for Promoting Experiments in
Horticulture:*

F. R. Tubbs, Esq., C.B.E., Ph.D., M.Sc., A.R.C.S., D.I.C.,
F.L.S., East Malling Research Station, near Maidstone.

Appointed by the Council of the Royal Agricultural Society of England:

Sir Thomas Neame, V.M.H., Macknade, Faversham, Kent.

Appointed by and from the Academic Staff of Wye College:

*H. S. Darling, Esq., Ph.D.

*I. W. Selman, Esq., Ph.D.

*Professor R. L. Wain, D.Sc., F.R.S.

*G. P. Wibberley, Esq., Ph.D.

*Appointed by and from the former Students of Wye College and Swanley
Horticultural College :*

*B. S. Furneaux, Esq., M.Sc., 94 Warwick Park, Tunbridge
Wells.

Mrs. F. Perry, Bulls Cross Cottage, Enfield, Middlesex.

CO-OPTATIVE GOVERNORS

*J. H. Berry, Esq., M.C., J.P., Redthorn, Chilham, near
Canterbury.

*Hugh R. Finn, Esq., Vinesole, Nackington, Canterbury.

*Miss E. A. Jones, M.A., 12 Park Close, Ilchester Place,
London, W.14.

Sidney H. Moon, Esq., O.B.E., Downside Farm, Cobham,
Surrey.

CLERK TO THE GOVERNORS AND STEWARD OF THE
ROYAL MANOR OF WYE

J. W. Kennard, Esq., Solicitor and Notary Public, 11 Bank Street,
Ashford.

* Member of the Executive Committee.

COLLEGE ACADEMIC BOARD

Chairman: The Principal

H. S. Darling, Ph.D.

D. A. Ede, Ph.D.

Professor W. Holmes, Ph.D.

Professor H. W. Miles, D.Sc.

P. C. J. Payne, Ph.D.

I. G. Reid, B.Sc.Econ.

I. W. Selman, Ph.D.

Margaret S. Smith, Ph.D.

E. Sita Smyth, M.A.

Professor R. L. Wain, D.Sc., F.R.S.

G. P. Wibberley, Ph.D.

E. H. Wilkinson, Ph.D.

Secretary: C. W. A. Garland, B.Sc.

THE STAFF OF THE COLLEGE

(1959-60)

(as at October 1959)

(R) *Principal*—Dunstan Skilbeck, C.B.E., M.A.(Oxon.).

Vice-Principal—E. Sita Smyth, B.A.(Bristol), F.L.A.

Secretary/Registrar—C. W. A. Garland, B.Sc.(Lond.).

DEPARTMENT OF AGRICULTURE

Professor of Agriculture and Head of Department:

(A) W. Holmes, B.Sc.Agric., Ph.D.(Glasgow), N.D.A.(Hons.).

Lecturers:

(R) P. C. J. Payne, M.Sc.(Dunelm), Ph.D.(Reading),
A.M.I.B.A.E.

J. E. Duckworth, B.Sc., Ph.D.(Dunelm).

A. E. Maddison, B.A.(Oxon.), Dip.Agric.Sc.(Cantab.),
F.S.S.

J. D. Paterson, M.R.C.V.S. (Veterinary Investigation
Officer).

Assistant Lecturers :

P. Innes, B.Sc.(Dunelm).
J. G. W. Jones, B.Sc.(Dunelm), Ph.D.(Aberdeen).
Marion Murray, B.Sc.Agric.(Edin.), M.Sc.(Ohio).

Farm Manager :

P. H. Keen, D.F.C., B.Sc.Agric.(Lond.).

N.I.A.B. Liaison Officer :

A. S. Gregg, B.Sc.Agric.(Reading).

Technical Staff :

Mrs. W. B. Askew
R. E. Peters
R. W. Smith

Field Staff :

V. N. Booth
C. Boynton
C. H. Day
G. Harrison

DEPARTMENT OF HORTICULTURE

Professor of Horticulture and Head of Department :

(A) H. W. Miles, M.Sc.(Bristol), D.Sc.(Manc.).

Senior Lecturer :

(R) E. H. Wilkinson, B.Sc.(Birm.), Ph.D.(Bristol).

Lecturers :

(R) A. A. Jackson, B.Sc.(Manc.).
J. T. Sykes, B.Sc.Hort., B.Sc.(Lond.).

Demonstrator :

Elizabeth Emmerson, B.Sc.Hort.(Lond.).

Gardens Steward :

Mary Page, N.D.H., Dip.Hort.(Swanley).

Market Gardens Manager :

R. S. Lewis.

Field Staff :

S. Garnham	D. Louden
T. E. Kite	E. Sheppard
A. W. Knight	D. R. White

DEPARTMENT OF BIOLOGICAL SCIENCES

Reader in Agricultural Botany and Head of Department:

(R) I. W. Selman, B.Sc., Ph.D.(Lond.).

Lecturers:

(R) R. M. Harrison, B.Sc.(Lond.), A.R.C.S.

(R) Frieda C. Schimmer, M.Sc.(Lond.), A.R.C.S.

D. A. Ede, B.Sc.(Lond.), M.Sc., Ph.D.(Edin.).

G. F. Pegg, B.Sc.(Lond.), M.Sc.(Nott.).

Assistant Lecturers:

W. A. Kelly, B.Sc.(Wales).

R. G. Milne, B.A.(Cantab.).

Technical Staff:

Nora Lepper.

DEPARTMENT OF PHYSICAL SCIENCES

Professor of Agricultural Chemistry and Head of Department:

(A) R. L. Wain, Ph.D.(Sheff.), D.Sc.(Lond.), F.R.I.C., F.R.S.

Senior Lecturer:

(R) Margaret S. Smith, B.Sc., Ph.D.(Lond.), A.R.I.C.

Lecturers:

G. P. Askew, B.Sc.Agric., B.Sc.(Lond.).

Jeanne Ingram, B.Sc.Agric.(Edin.), M.Sc.(Lond.).

D. R. Williams, M.Sc.(Wales).

Assistant Lecturers:

J. B. Dalrymple, B.Sc.(Sheff.), M.Sc.(Lond.).

E. W. Weston, B.Sc.(Lond.), A.R.C.S. (Analyst).

Technical Staff:

D. Simons (Chief Technician).

R. F. Curtis.

DEPARTMENT OF ECONOMICS

*Reader in Agriculture, with special reference to Agricultural Economics,
and Head of Department:*

(A) G. P. Wibberley, B.Sc.Agric., Ph.D.(Wales), M.S.(Illinois).

Lecturers :

- (R) R. R. W. Folley, B.Sc., B.Comm.(Leeds).
(PR) I. G. Reid, B.Sc.Econ.(Lond.), Dip.Agric.(Cantab.).
(R) J. D. Sykes, B.Sc.(Leeds), N.D.A., Dip.Agric.Econ.(Oxon.).
(PR) J. T. Ward, B.Sc.Econ.(Lond.), B.Litt.(Oxon.).
G. Allanson, M.A.(Cantab.).
R. H. Best, B.Sc.(Dunelm), M.Sc.(Lond.).
E. S. Clayton, B.Sc.Econ.(Lond.).
W. L. Hinton, B.A.Comm.(Manc.), N.D.A.

Assistant Lecturer :

G. J. Tyler, B.Sc.Agric.(Lond.).

Technical Staff:

H. G. Halls.
J. H. Hooper, Dip.Agric.(Wye).
N. P. C. Croucher.
H. Curtis.
K. L. Oake.

DEPARTMENT OF HOP RESEARCH

Principal Scientific Officer and Head of Department :

(R) H. S. Darling, B.Sc., M.Agric.(Belfast), A.I.C.T.A., F.R.E.S.,
M.I.Biol.

Senior Scientific Officers :

R. A. Neve, B.Sc.Agric.(Reading), Dip.Agric.Sci.(Cantab.),
M.I.Biol.
F. C. Thompson, B.Sc., M.Sc.Agric.(Dunelm), A.R.I.C.

Scientific Officers :

J. R. Coley-Smith, B.Sc., Ph.D.(Birm.).
I. H. Williams, M.Sc., Ph.D.(Nott.).

Senior Experimental Officer :

F. H. Beard, Dip.Hort.(Wye).

Experimental Officer :

R. F. Farrar.

Field Staff:

J. W. Ashby.

- (A) Appointed teacher of the University of London.
(R) Recognized teacher of the University of London.
(PR) Provisional recognition as a teacher of the University of London.

AGRICULTURAL RESEARCH COUNCIL GROWTH SUBSTANCE
AND FUNGICIDE UNIT

Honorary Director :

Professor R. L. Wain, Ph.D.(Sheff.), D.Sc.(Lond.),
F.R.I.C., F.R.S.

Principal Scientific Officer :

C. H. Fawcett, M.Sc., Ph.D.(Lond.), A.R.I.C.

Senior Scientific Officer :

D. M. Spencer, B.Sc.(Wales), Ph.D.(Lond.).

Scientific Officer :

H. F. Taylor, B.Sc.Hort.(Lond.).

Experimental Officer :

P. Cozens.

Assistant Experimental Officers :

G. A. Carter, B.Sc.(Reading).
Pamela R. Willett.

COLLEGE ADMINISTRATION

Registry

Assistant Registrar : A. G. Page, M.A.(Oxon.).

Library

Assistant Librarian : Margaret E. Mitchell, B.A.(Lond.),
A.L.A.

Bursary

Accounts Officer : A. Ireland. W. G. Munt.
H. J. Jordan.
Domestic Bursar : Eleanor M. Knight, M.C.A.
C. Hayward.
Gladys Martin.
Mrs. F. Fawcett, S.R.N.

Maintenance Officer : J. C. Foster. C. W. Whaley.

Head Porter : T. R. Oliver, D.S.M.
G. J. Flannigan.

College Office

Secretary to Principal : Mary M. Skinner.

WARDENS

Warden of Men Students : C. W. A. Garland, B.Sc.(Lond.).

Warden of Women Students : E. Sita Smyth, B.A.(Bristol), F.L.A.

Assistant Wardens : Jeanne M. A. Ingram, M.Sc.(Lond.).
J. T. Sykes, B.Sc.(Lond.).
I. H. Williams, Ph.D.(Nott.).



By kind permission of Mr. Douglas Weaver, Ashford

The arrival of His Royal Highness the Duke of Gloucester at Coldharbour Farm on 10th June, 1960.

Left to right: The Principal, Major Chamberlayne-Macdonald, His Royal Highness, Lord Brabourne, Lord Northbourne, Professor Holmes, Mr. P. Keen.

THE REPORT OF THE PRINCIPAL
TO THE GOVERNING BODY OF THE COLLEGE
OF ST. GREGORY AND ST. MARTIN AT WYE

for the

Academic Year ended 30th September, 1960

During the year the College was again honoured by many distinguished visitors, and on two occasions Royal Standards were flown at the College flagstaff. In June we were delighted to receive a visit from His Royal Highness the Duke of Gloucester, whose proposed visit last year had had to be postponed. This was an entirely informal occasion, its main purpose being to see something of the work of the College farm and to discuss farm management problems with members of the Departments of Agriculture and Agricultural Economics. During his visit the Heads of Departments and members of the Student Union Council were presented, but otherwise the informality of the visit was maintained at the express wish of His Royal Highness. The College derived great pleasure from this visit which gave us the rare honour of being able to entertain our very distinguished guest, himself so much a farmer at heart, with simplicity and to discuss with him many farming problems, particularly those closely associated with the maximization of farm profits. We shall long remember his keen enthusiasm for all he saw and the College is deeply indebted to His Royal Highness for his great interest in its farming activities.

On Whit-Sunday we received a visit from Her Royal Highness Princess Nehza, the Crown Princess of Morocco, who graciously consented to accept an invitation extended by the student Moroccan Expedition, to which further reference will be made. Attended by Princess Fatima Zahra, Her Royal Highness lunched in Hall with the students who, at her request, were entirely responsible for another delightfully informal visit. It was not only a great honour to the College to receive such a visit, but also particularly pleasing to those students directly concerned with the then forthcoming expedition to Morocco to receive such a mark of favour and support. Her Royal Highness, herself a student in this country, was much interested to see something of student life and activities at Wye; her visit most fortunately coincided with one of the few really hot

sunny days of last summer when the gardens through which she walked were looking at their very best.

The College was also honoured to receive a visit from Academician Kursanov, the Director of the Timiriazev Institute of Plant Physiology at Moscow, who had been invited by the Royal Society to present three lectures in this country, the first of the series being given at the College. We were extremely grateful for this opportunity to hear such an interesting account of plant physiology research in the U.S.S.R. from a very distinguished Soviet scientist who impressed his audience both by his mastery of his subject and by his personal charm and good humour. Not only was it a delight to receive his lecture, shortly to be published by the College, but also to have an opportunity for many interesting informal conversations with him in Senior Common Room and in laboratories about scientific developments in the U.S.S.R. and cognate matters. It may be hoped that his visit will be the precursor to others from and to the U.S.S.R. to the benefit of better mutual understanding which was begun at the College under such happy circumstances.

Amongst other visits may be noted the exchange visit of Professor Robertson of Ontario Agricultural College, Canada, with Mr. J. D. Sykes, who spent the long vacation in Professor Robertson's College. Such exchange visits are much to be welcomed by the College, whose gain is doubled thereby. Our only regrets were that Professor Robertson was unable to spend more time with us at Wye during his visit to the United Kingdom and western Europe.

In addition the College received visitors for the day and for longer periods from Universities and Research Institutes in no less than 19 countries overseas, including the U.S.A., Australia, New Zealand, Canada, Japan, Turkey, the United Arab Republic and Yugoslavia, as well as large numbers from nearer home. Through such visits from overseas, as well as from sister institutions at home, combined with the increasing number of visits which our own staff make abroad, the work of the College is made known to a greater number of scientific workers in fields closely allied to our own and, in return, much stimulus is given to our own work. Not so long ago the fear was expressed that the relative isolation of the College might be a severe detriment to its work and development. I myself never subscribed to such a view and experience would seem to have amply disproved it. The only fear is that the better communications promised by British Railways when once the line to Wye is electrified may prove as much an embarrassment to peace of mind and work as an advantage in reducing the effective distance of Wye from London.

The Governing Body

The names of three members of the Governing Body were included in this year's Honours Lists. Mr. Thomas Neame, V.M.H., received a knighthood, Dr. F. R. Tubbs was appointed a C.B.E., and Miss M. Maplesden Noakes an M.B.E. In offering them the congratulations of the College I should also like once again to express our debt of gratitude to members of our Governing Body who, in spite of the many other calls upon them, give so liberally of their time to College affairs. The bestowal of such honours not only affords them the public recognition they have so well earned but also reminds us of our good fortune in being served by a Governing Body whose individual members in their various fields contribute so much to the public good and bring to the direction of our affairs the benefit of their wisdom and experience.

At the end of the session Mr. J. W. Kennard retired from the Clerkship of the Governing Body after serving in that capacity with great devotion to the interests of the College for twenty-five years. He will be greatly missed, especially by the Governing Body, whose meetings he has attended regularly for so many years and whose good wishes, along with those of the College as a whole, he takes with him on retirement. Mr. Kennard has been not only a devoted servant of the College but also a most generous benefactor to it. Amongst his many gifts may be called to mind the stained glass window in the College Chapel, another in the Cloisters, and a most delightful water colour painted by the Provost of the College which hangs in Senior Common Room. His wisdom, sound counsel and personal friendship will long be remembered in gratitude and affection by all who have served with him.

It is a pleasure to welcome as a new member of the Governing Body, Professor T. A. Bennet-Clark, F.R.S., Head of the Department of Botany and Plant Biology at King's College, London, appointed as a representative Governor by the Senate of the University in place of Dr. Raeburn who resigned last year on taking up the appointment of Professor of Agriculture at the University of Aberdeen.

The Student Body

Student numbers continued to increase; the total enrolment at the beginning of the session, the details of which are given in Appendix II, was 243 as compared with 229 in the previous year. The number of women students again declined slightly. With only 42 women on the student roll women students are acquiring something of a scarcity value and the women's sports clubs in particular are encountering difficulties in regard to membership. On the other

hand, it is gratifying to record a further significant increase in the number of postgraduate students, partly due to a further intake into the postgraduate course in Poultry Science, although all Departments of the College have made a contribution to this welcomed increase.

Student numbers have now reached a point where it is necessary to consider to what extent any further increase can be contemplated. The gradual increases from year to year have so far been met by adaptations of existing College accommodation and the conversion of small newly-acquired properties, but numbers have now reached a point beyond which no further increase can be met without substantial additions to residential, refectory and teaching accommodation. It might be held that no considerable increase over present numbers should be contemplated because any such further increase would almost inevitably change the character of the College. It has been one of the most valued characteristics of Wye that student numbers have been such as to allow close personal contact between staff and students and to foster a strong corporate sense which might be endangered if numbers were to be increased substantially. On the other hand, if there is to be country-wide expansion of University places it is felt proper that the College should play its part in the general programme of expansion and that, in the long run, it would gain therefrom much more than it might be held to lose. The Academic Board and the Governing Body have been giving careful thought to this problem during the year and it has been resolved that, should circumstances warrant, the College would wish to achieve a substantial increase in student numbers in the belief that by so doing it could make worthwhile contributions towards meeting the demands of those seeking University education in the subjects for which it can provide facilities, and that such an increase would make it possible for it to broaden its activities in several important fields. Therefore, although the College is at the moment as full as it can possibly be, present numbers are not regarded as the maximum beyond which we would not be prepared to expand, but rather that the challenge to so doing would be welcomed provided that it could be carried through as a well-planned, well-phased operation. What past experience and the limitations imposed by present buildings, both academic and residential, have shown is that no further piecemeal expansion in student numbers can be undertaken.

Examination results were generally satisfactory and are given in detail in Appendix III.

Amendments to the National Service regulations by which students completing degree courses in July 1960 or later are free

from National Service liability, appear to have been welcomed by those concerned, and few can regret the termination of regulations which all too frequently involved a wasted two years at a very important time in a student's early life. Had the authorities concerned been able to make better use of the time so occupied the experience might have been valuable to many, but as long as the College maintains its insistence on a year of practical work between school and entry to the College it is believed that for our own students there will be nothing but gain in the abolition of the National Service liability. In my own view our students gain a very great deal from their practical year, quite apart from the technical training which it involves. They are more mature than those who come straight from the VIth form to the University, have had a wider experience and, in most cases, have acquired some realization not only of what is involved in routine manual work but also something of what it means to be a weekly wage-earner. I only wish that such a system, now that National Service is no longer required, could be more generally introduced into our Universities.

Student health was good and the skilled services of Dr. Balfour and Sister Fawcett fortunately less in demand than in some previous years. The College is, in addition, grateful to Dr. Flack who now deals with some of our student ailments and injuries and whose frequent and welcome presence on the Rugger field sometimes involves him in becoming more than a spectator.

The Staff of the College

The College warmly congratulates Professor R. L. Wain on his election as a Fellow of the Royal Society and the award of the Royal Agricultural Society's Gold Research Medal for 1960 for his outstanding contribution to agricultural research. Professor Wain's election is especially notable in that this is the first occasion on which a serving member of the College has become a Fellow of the Royal Society. The work of the research team which he leads and directs with such success had made a most distinguished contribution in its field, in which the College justifiably takes pride.

Resignations, appointments and promotions during the year are recorded in Appendix I. Recognition as a Teacher of the University was accorded to Mr. J. D. Sykes, and the M.Sc. degree conferred upon Mr. A. H. Rowe and the Ph.D. on Mr. J. T. Ward.

It was with great regret that the College learnt, in November 1959, of the death of Dr. Maurice Froud who was Lecturer in Zoology at the College from 1946 to 1957. The news of his death in Kumasi, Ghana, where he had held a teaching appointment, came as a shock to his former colleagues, who knew him as a

gifted teacher who contributed much to the formative life at Wye in the immediate post-war period.

The new University salary scales were brought into operation in August, the increases having been granted retrospectively from 1st January 1960. It was a great satisfaction to all senior members of the College to receive this increase and to feel that their salaries were, at least in some measure, tending to be kept a little more in line with comparable salary scales.

Several members of the academic staff and research departments again made visits overseas, details of which are given in the departmental reports which follow. I myself was most grateful for the privilege accorded to me to visit Egypt in January and East Africa and Southern Rhodesia during the Easter vacation. The former visit was made at the request of the British Council as a member of a small visiting scientific mission, the first to be made to Egypt since the Suez catastrophe; the latter at the request of the University to visit Makerere College, Uganda, and the University College of Rhodesia and Nyasaland at Salisbury. On both occasions I had the opportunity of visiting former students of the College. It was a great delight to be welcomed and royally entertained in Egypt by a group of former postgraduate students, whose hospitality and friendship so quickly and easily surmounted the bleak period of tension. I also took the opportunity of staying with some former students in the White Highlands of Kenya en route for Salisbury, where I was invited to attend the inaugural dinner of the Rhodesian branch of the Agricola Club. The ready welcome that awaits one wherever former graduates of the College are to be found is a very real and rare pleasure for those of us who are fortunate enough to travel to distant places. The affection in which the College is held by so many, even though more years than they like to remember separate them from their student days, is something of which the College can be proud for such memories are tradition in the making.

Teaching

Some concern was expressed at the additional load caused to staff of the teaching departments by the increasing number of students and the need for additional staff in the Departments of Biological Sciences, Physical Sciences and Agriculture was agreed in principle. A number of additional posts have since been established and most of these have been filled for the coming session, though one or two existing posts still remain to be filled. A careful assessment was made of the claims of tutorial work and lecturing on the time

of those primarily concerned with teaching and it is considered that the additional establishment now sanctioned leaves staff concerned adequate time for study and research over and above their teaching duties. Minor modifications were again made to the final examination for B.Sc.(Agriculture), and consideration was also given to the further modification of existing courses and to the possible introduction of new courses, including a postgraduate course in Farm Management. Discussions on these matters are being continued by the Academic Board.

Student Activities

The College again did well in the field of sport and athletics. Notwithstanding their diminishing numbers, the women students again won the Sherwood Cup in the University Athletics Championships. David Dutton won the University Open Golf Championship and David Thorburn was elected University Captain of Swimming. The Rugger team won sixteen out of thirty matches and would no doubt have done better but for the fact that injuries put the Captain and several other members of the team out of action early in the season. The Soccer team had one of its most successful seasons since the war, losing only two out of thirteen matches. The College Ploughing team again won the Harry Ferguson Challenge Trophy at the inter-University match at Nottingham University and regained the Fordson Challenge Cup at the inter-College match at Boreham Wood.

Robin Mackenzie completed a successful year as President of the University of London Students' Union. His term of office was especially pleasing as emphasizing the close connection of the College with the University, a connection further illustrated by the fact that the College Union Society entertained at its dances over fifty guests from constituent College Union Societies of the University.

Two concerts were given by the Music Society and a programme of subscription concerts, details of which are given in Appendix IX, was again arranged by Mrs. Selman under the auspices of the Arts Council of Great Britain. The programme of College Lectures for the year is given in Appendix X.

The College as a whole suffered a sad loss by the sudden death of Mrs. Folley who for a number of years had arranged a series of art exhibitions in the Swanley Hall. As Evelyn Dunbar she was a well-known artist in her own right and had the distinction of being the only woman to be appointed an official war artist during the last war. An example of her talented and imaginative painting

hangs in the entrance hall at Withersdane. She had many friends, both in the artistic world and outside it, and it was a measure of her friendship that so many artists of repute willingly lent their pictures to the College for exhibition at her request. She had a very sincere and warm-hearted interest in young people and inspired both admiration and deep affection among the numerous members of the College with whom she came in contact. Only a very short time before her death the College had enjoyed one of the exhibitions for which it was indebted to her, on this occasion a collection of paintings and drawings by John Ward, A.R.A., and by Gordon Davies, A.R.C.A.

Activities of student societies as yet unmentioned were, as usual, many and varied. The Christian Fellowship were fortunate in having the Visitor, His Grace the Archbishop of Canterbury, to speak on Christianity and Politics at an open meeting in the Autumn Term. The Dramatic Society produced two plays in rather lighter vein than some that have been chosen of recent years; *The Hollow* by Agatha Christie and *Doctor in the House*, both of which were played to appreciative audiences and obviously enjoyed by the cast.

The Exploration Society arranged an expedition to Morocco during the summer vacation which was accomplished with considerable success. The Society is particularly grateful to all those organizations and firms which so generously supported its venture. Useful surveys were made of local agricultural systems and some pedological investigations carried out. An interim report on the Expedition was published at the beginning of the Autumn Term and the final report is awaited with interest.

A number of students again undertook practical work on Continental farms during the summer vacation, through arrangements made either by I.A.E.S.T.E., or by the College Student Exchange Organization, and five went by charter plane to do farm work in Canada. Two Wye students joined a party of students on an interesting visit to the U.S.S.R. under the auspices of the N.U.S. during the Easter vacation. The College was again pleased to welcome a Danish student for a month's exchange visit at the beginning of the Summer Term and two Norwegian students and two German students for practical work on the College farm during the summer vacation. Summer vacation tours were again arranged for the second year Agriculture and Horticulture students and for Poultry Science postgraduate students, the Agriculture tour being based this year on Durham and the Horticulture tour on Bristol. The first and third year Agriculture students themselves organized a joint farming tour in the west country.

Benefactions

The College is again deeply indebted to its many benefactors whose gifts are recorded in the Benefactions Book and enumerated in Appendix VIII. Particular mention must be made of the institution of a postgraduate studentship by the Hops Marketing Board and of a postgraduate fellowship by the Egg Marketing Board, as well as of a gift of £500 from Messrs. Pfizer Ltd. for the provision of additional facilities in the Poultry Research Department. A subscription list was also opened under the auspices of the Hops Marketing Board to establish a memorial at the College to the late Professor Ernest Salmon. The subscriptions from hop growers, factors, merchants and brewers, to which the Governing Body of the College made a contribution, amounted to £5,000, which will be used for the establishment and equipping of the Ernest Salmon Library. The College gratefully acknowledges the many contributions which have been made to this fund and is most appreciative of the opportunity given to it to establish a permanent memorial to one of its distinguished members.

Commemoration

Arrangements for Commemoration were on similar lines to the preceding year, with the Commemoration Service at noon and the Commemoration ceremonies in the afternoon following the Governors' luncheon. The chief guest was Dr. C. F. Harris, Vice-Chancellor of the University and Dean of the Faculty of Medicine from 1952 to 1956. His theme, drawing parallels between agriculture and his own discipline of medicine, was a most happy one, giving the College an opportunity to regard the problems with which it is primarily concerned from a new point of view and, by learning something of related disciplines, to extend its horizons. At the Commemoration celebrations the College admitted as Fellows two of its distinguished former members, Sir Geoffrey Nye, K.C.M.G., Agricultural Adviser to the Secretary of State for the Colonies, a former graduate of the College, and Dr. Norah Penston, Principal of Bedford College, the Vice-Principal of Wye College from 1945 to 1951. A farewell presentation was also made by the Provost to Mr. Kennard.

The College Estate and Buildings

The new laboratory block was completed and brought into use at the beginning of the Summer Term, and the old laboratory accommodation thus made available converted into extra lecture rooms and studies for the staff. No major alteration was made to

student accommodation, but the College was enabled to purchase with funds made available by the Court of the University, the property known as the Old Vicarage facing the old village green, together with a small area of land on the green itself, now derelict, which it is intended to develop as a garden for the enjoyment of the College and the town. The house will, in due course, be converted for additional student study-bedrooms. Part of the allotments between Scotton Street and the Horticultural Department were also purchased and thereon has been erected a new aluminium alloy mobile greenhouse, leaving adequate space for a second such unit.

In addition to the new Physical Sciences laboratories now completed, consideration was also given to preliminary plans for new Biological Science laboratories and the rehousing of the library in more extensive quarters within the College precinct. The new playing fields were in use throughout the year and were generally considered to be an improvement on the former grounds. The equipping of men's changing rooms at Withersdane was completed and gave much satisfaction to our visiting teams as well as to those residents in J Block who formerly had to provide for their needs in very cramped quarters. The Maintenance Department carried out much routine and minor work, although the term "minor" scarcely adequately describes tasks such as the removal and replacement of a large water tank in B Block roof or the expert laying of the new lawns adjacent to the new laboratories, which the staff of the Department undertook with their usual equanimity and efficiency.

Administration

In May the College received its quinquennial visitation by the Agricultural Sub-Committee of the University Grants Committee under the Chairmanship of Sir Keith Murray; the College was supported by the Principal of the University, Sir Douglas Logan, and the Clerk of the Court, Mr. J. R. Stewart. The Sub-Committee spent most of a day at the College and discussed all aspects of College affairs at meetings with representatives of students, staff, and the Governing Body. These regular visitations are welcomed as an opportunity to show members of the University Grants Committee how the capital and other funds allocated to the College have been expended and to discuss with them personally current needs and future plans.

During the year several official Committees produced reports and recommendations which affect the College and other University

institutions. In accordance with the recommendations of an *ad hoc* Committee set up by the Committee of Vice-Chancellors and Principals of the Procedure for the Admission of Students, slight modifications were made to student admission procedure mainly with a view to uniformity of procedure as between different institutions. The chapters of the Crowther Report on the Curriculum of the Sixth Form and the Problem of University Entrance, and the Ministry of Education's Report on Grants to Students were studied with much interest. The College has for many years adopted the general principles of selection advocated in these reports, and apart from a slight increase in administrative work arising from a larger number of grant-aided students, no substantial change in the administration appears to be involved in the implementation of their recommendations.

Considerable interest has been aroused by the discussions now proceeding with regard to the establishment of a University of Kent, probably as a near neighbour. The existence of such an institution would be greatly welcomed by the College which would certainly derive much stimulus therefrom and, it believes, could contribute something thereto from its own long experience. Both junior and senior members of the College would gain much from the close association which would be certain to be developed between our own ancient foundation and a much-needed new University.

Conclusion

A recent analysis carried out at the College of undergraduate performance at their first and final University examinations showed singularly little correlation with their previous performances at their General Certificate of Education examinations taken in their last year at school. How one wishes that a parallel comparison could be made twenty years later with their final examination results and their subsequent contribution to society. There the difficulty would be to arrive at any objective standard of measurement, but at least the earlier comparison between academic standards reached at school and at the University should have some validity, in that like is being compared with like. The odd thing, however, is that the expected close correlation does not in effect seem to be achieved. Yet Universities and the Faculties of which they are comprised to a greater or lesser extent demand specific performance at these school examinations, denying the right of entry to those who have not got the particular combination of certain selected subjects or the standards in those subjects which are held to be minimal. Our own University, in my view, has been

wisely liberal in its general University entrance requirement (Matriculation), and in many of its Faculties there is a welcome tendency to become less specific about the pre-entry requirements for particular degree courses. Obviously certain groups or combinations of subjects are desirable for the study of certain University disciplines, but the more rigid these become the more the individual will suffer through circumstances often beyond his control. Furthermore, by throwing back on the schools the onus of early specialization the more the Universities will suffer from inadequately educated students. We in the Universities are often only too ready to deplore the latter whilst being responsible for the former. Many of us are woefully out of contact with the schoolmaster's problem and too often fail to regard University study as the final phase in a comprehensive system of higher education. There is a tendency to regard almost all that goes before the University phase as subservient to it. The Crowther report,* to which brief reference has already been made, has highlighted many of the problems in regard to the relationship of the VIth form and the University. Its patient study will go far to strengthen the bridge between school and the University, which it is felt is somewhat narrow and insecure at the present time.

The Academic Board of the College is again beginning the reconsideration of the nature and structure of the degree courses for which the College is responsible with a view to laying its proposals before the relevant committees of the Senate. It is to be hoped that it will take full cognizance of the new and more liberal climate of opinion which is now beginning to prevail, yet the problem is admittedly one of great complexity. If, for example, students are admitted to a particular degree course with widely ranging scholastic backgrounds much of the first year work will inevitably have to consist of bringing all to a common standard of attainment, resulting in waste of time for some and the overtaxing of others. *Per contra*, the rigid insistence on particular standards or particular groups of subjects will deny to many of good ability even the chance of entry upon the course.

To achieve an effective workable compromise is no easy matter, yet it is one of the greatest importance for it is curious to how great an extent the decision on the required pre-entry qualifications colours the whole subsequent structure of a degree course. Much experience has been gained at the College over the past fifteen years, not only with our own degree courses but also with those with which many of us have been concerned in connection with the University Colleges overseas in special relationships with our own University,

* Report of the Central Advisory Council for Education, England, 1960.

and it may be hoped that wise counsel may prevail. Our own problem is complex in that we are concerned with many disciplines covering a wide field, though it is at the same time, perhaps, easier to solve in that it should be less essential to be as specific in our demands as in the case of many of the more precise disciplines.

Little apology is needed for concluding an annual report with a very brief discussion of but one of the academic problems now facing us. The discussion concerning degree syllabus revision will be of the utmost importance to the College as a whole during the next twelve months and will inevitably affect the contribution it will make over at least the next decade, quite apart from the influence it will have not only on those students it can accept but on those unknown youngsters whom it will perforce have to reject. Each week the student selection panel meets to interview candidates for admission. Not all who present themselves can possibly be accepted for, quite apart from academic considerations, there are not "beds for all who come". On what does final selection depend? Surely on a wise judgment, based upon experience, amalgamating an assessment of academic potential, suitability for the chosen career, and that nebulous but all-important evaluation of the competency of the individual to contribute to and profit by the privilege of University education.

Between the point of acceptance and the writing of a reference for the first appointment after graduation lies the responsibility for the whole of the course, its structure, its objective, its methods of teaching. But it all begins when the youngster is first told he is accepted or, as likely as not, ends when for some reason or another he is rejected. These are responsibilities which lie outside the narrower confines of a well-considered, well-constructed degree syllabus, yet they are closely and intimately associated with it and at the College both lie to a very great extent in our own hands. It is as well that we should welcome and admit the responsibilities involved.

DUNSTAN SKILBECK

October 1960.

DEPARTMENT OF AGRICULTURE

Teaching

Student numbers remained high, particularly in the Second Year, and in some instances it has been necessary to run double classes. Such methods and the gradual augmentation of teaching staff will enable the individual tuition, which has been a feature of the College, to be maintained even with greater numbers.

At Final Examinations, in the Honours group of 12 students 1 gained First Class Honours and 2 gained Upper Second Classes. No student failed. In the General group, out of 30 students sitting the examination (including one external candidate) 28 internal students gained degrees, including one in the First Division, 14 in the Second Division and 13 in the Third Division. Fourteen students also sat the examination for the National Diploma in Agriculture and all were successful therein. None gained a First Class Diploma (of which only 4 were awarded to 400 candidates), but 9 gained Second Class Diplomas and 5 Third Class Diplomas. This additional qualification is still highly regarded as a more practical qualification of particular value to the prospective farm manager. Final Examinations were also held for the first time for the degree of Master of Science in Poultry Science and eight students out of ten who sat the examination gained the degree.

As in previous years, a summer farm tour was held immediately at the end of Summer Term; on this occasion over 20 Second Year students went, under the leadership of Dr. Duckworth, to a base at Newcastle from which they radiated to all parts of Northumberland and gained valuable experience of the upland and lowland farming in that county.

Research

No further postgraduate students joined the Department during 1959/60, but those already in residence carried out some very useful work during the year. The following brief reports on current work include some of the work of these students.

Animal Studies

Feed Intake on Grassland. Preliminary work on the feed intake of sheep which had been carried out in winter 1958/59 was followed by field studies throughout the summer of 1959, which gave information on the quantities of feed consumed by Kent wether

tegs weighing about 130 lb. Full analysis of the summer work revealed that the marker, chromic oxide, did not appear to be fully recovered under these conditions and further investigations are being carried out with a view to finding an explanation of this phenomenon, which may be due to a retention of the marker in some form in some part of the body.

Meanwhile, as noted in last year's report, an experiment on the feed intake of grazing cattle was also undertaken. It was carried out under very dry conditions and although the results appeared satisfactory the experiment was repeated under more normal conditions in May and June 1960. Data are now available on the intake of 18 animals ranging from 400 to 1,400 lb. live-weight, and at present the relationship between feed intake, live-weight and rate of live-weight gain is being studied.

These feed intake techniques will be applied to other aspects of cattle and sheep production. Already a preliminary experiment to measure the influence of level of milk yield on feed consumed by milking cows has been carried out, and this will be repeated in 1961.

Dairy husbandry. An experiment was carried out in 1959/60 in which an attempt was made to measure the effect of a period of under-nutrition during lactation on total milk yield and on milk composition. For this purpose cattle were fed on very indifferent hay which was bought in (estimated Starch Equivalent 20) and concentrates at a low level (3 lb. per gallon). This resulted in a feeding level of only 75% of the normal standards, and there was a fairly rapid decline in milk yield and some deterioration in milk quality. Where this low level of feeding was not continued more than three weeks recovery in yield and milk composition was rapid, but where the low level of feeding was continued for eight weeks cattle were slow to recover even when on grazing and the lactation was shortened and reduced by about 50 gallons.

The experiments on steaming up of autumn-calved cows continue. So far the broad conclusion as indicated last year is that *provided adequate feed in the form of grazing, hay or silage* is available the steaming up of autumn-calved cows has no significant effect on milk yield or milk composition. This does not, however, mean that steaming up is never necessary; cows which have been on poor rations, especially those calving in February, are likely to benefit considerably.

Detailed study has now also been made of the relationships between the cell count or leucocyte count of milk and milk composition. Significant correlations and regressions have been established which indicate that a ten-fold increase in cell count, for example from 80,000 to 800,000 per ml., is associated with the

presence of the organisms causing staphylococcal mastitis and results in a decline in S.N.F. of about 0.4%, mainly in the lactose fraction. While this study defines the problem it does not offer a solution. It is, however, clear that one of the major problems in the maintenance of high quality milk is the control of subclinical forms of mastitis.

Pigs. The new selection programme for carcase length of pigs was put on a sound basis in the current year. The early difficulties were fully overcome and, thanks to skilled attention by the herdsman, the programme was run according to time. The test pigs which were sibs of the parents of the new generation gave an average daily gain in the fattening period of 1.47 lb. with a food conversion efficiency of 3.4. Boars were selected from litters which averaged 824 mm. in length of side and gilts were selected from litters averaging 818 mm. This compared with an overall average for the population of 806 mm. and led to the expectation of fairly substantial genetic increase in length in the next generation.

The new generation farrowed very successfully in March, thrived well, and final test results are now available. Over all the data the genetic improvement in length was only slight but the lack of improvement was confined to the progeny of only one boar of the previous generation. When they are excluded improvement was in accordance with expectation. In such a programme it is obviously essential to continue over several generations, and the work continues.

It is worth stressing that the considerable technical and husbandry difficulties in this programme have been virtually overcome, that a 12-month generation interval has been achieved and that 40 young boars and over 100 gilts have been reared successfully to be fit for mating at under 8 months of age.

Poultry. The egg quality building in the poultry section was badly damaged by fire in November 1959, but rapid repairs have been made and the building is now fully operational again. Studies in selection for egg production continue but the programme, which had for many years concentrated solely on egg number, was modified for the R.I.R. flock so that within the same population selection for egg number continued, selection for egg size was introduced, and a control flock was maintained at the existing level.

This development was only possible because of the refinements to the technique which could be suggested on the basis of earlier experience. It now makes the experiment much more valid in that any environmental fluctuations in yield from year to year can be taken account of. It will also indicate whether the production of high yields of large-sized eggs is readily attainable. Unfortunately, many of the statistical analyses carried out on past data were

destroyed in the fire, but it is hoped to replace these from the original data with the help of the University Mercury computer. Studies in egg quality were also severely interrupted by fire damage, but have been resumed during the summer period. Several brief articles on factors influencing egg quality have been prepared.

Facilities have again been provided for students taking the Poultry postgraduate course to gain experience of experimental methods and, as the list of titles at the end of this report shows, a wide range of subjects has been tackled.

Crop Studies

Engineering. The re-arranged Workshop made demonstration of farm machinery much more effective during 1959/60. No further research work has been carried out, but among the many items of specialized equipment which have been developed is an air-flow planimeter. This equipment enables the formerly tedious task of measurement of leaf area to be carried out rapidly and accurately and should be of great value in the study of crop physiology.

Grassland Production. The experiment carried out in 1959 under greenhouse conditions in which the influence of frequency and closeness of defoliation on the yield of pasture herbage was repeated in 1960. Close defoliation has given a substantial increase in herbage yield and the main object of this work is to explain on a physiological basis the differences which have been observed. These amount to an increase in yield of some 20-30% from closely defoliated pastures compared with those clipped to about 3 inches of ground level, and studies so far show that close defoliation considerably increases the photosynthetic area of the pasture.

White Clover. The experiments on clover seed production were repeated for a third year. Unfortunately it was necessary to repeat them on a field which had already borne clover seed and, probably as a result, the yields per acre were appreciably lower than in 1959. The evidence from these three years' experiments, however, is fairly clear-cut in showing that the traditional Kentish method of intensive grazing with sheep from early March until late May or early June gives the best yield of clover seed. However, what is perhaps more striking is the evidence that some of the non-traditional methods such as gang mowing, and even cattle grazing plus hayter mowing, will provide yields approaching the same level. Such methods would greatly increase the flexibility of the system of husbandry.

In addition to these field studies, growth room studies on the growth and development of white clover have been carried out.

It is now clear that seedling clover will flower in its first year without any frosting, but clover which has already flowered requires the influence of low temperatures for a short period to induce second flowering. This work on clover seed production is drawing to a close and will lead to several publications. The assistance of the Kent Wild White Clover Seed Committee of the National Farmers' Union in furthering this work by a financial grant is gratefully acknowledged.

Potatoes. Experiments have also been carried out on potato production for three years and, again, are being drawn to a close. In summary these indicate that where 20 tons of farmyard manure has been applied, a dressing of about 10 cwt. of compound fertilizer is adequate; they also indicate that irrigation can substantially increase yields in a dry year, although in a wet year it may aggravate conditions by increasing the incidence of potato blight. Chitting gave a small but worthwhile increase in yield due to the earlier development of the crop, but mulching of the crop with straw proved to be of little value.

Wheat. A series of experiments is now in progress on the fertilizer treatment of wheat grown after leys. This was carried out in 1959 after a timothy-fescue ley and in 1960 after ryegrass, timothy-fescue and lucerne leys. In all cases no advantage was obtained from the provision of phosphorus and potash fertilizer in the seedbed, but there was an increase in yield of grain following the application of 2 or 4 cwt. of sulphate of ammonia per acre. Applications of 6 cwt., however, reduced yields below those at 4 cwt., presumably because of the depressing effect on lodging. This work is of particular interest and it will be repeated in 1961 on three ley types and also on a field at the end of its arable phase.

Extension Work

The Department again received many visitors, particularly at the time of the Eighth International Grassland Congress which was held in Britain. The Chick Producers' Association held a well-attended and successful Refresher Course at the College during September. A printed Guide to the Department of Agriculture and College Farm was again prepared; this drew several favourable comments and was of great assistance to both visitors and students.

Extra Mural Activities

Members of the Department gave a number of lectures to farming and other organizations. In particular, Professor Holmes gave several lectures on grazing management to bodies, including

the Yorkshire Grassland Society and a N.A.A.S. Conference in Aberystwyth, and Dr. Payne lectured on the application of soil physics to agricultural engineering on several occasions; Mr. Maddison gave several lectures on various aspects of poultry breeding.

Professor Holmes acted as Internal Examiner for the Final B.Sc.(Agriculture) degrees of the University and was Examiner in Agriculture for B.Sc.(Estate Management) and for B.Sc.(Agriculture) degrees awarded in the University Colleges in Special Relationship at Ghana, Ibadan and Makerere. He also acted as External Examiner in Agriculture for the University of Durham. He served on the Committee on the Composition of Milk (the Cook Committee), appointed by the Ministry of Agriculture, which reported in September 1960. He was a member of the Programme Committee of the Eighth International Grassland Congress held in 1960 and was appointed to the Natural Resources (Technical) Committee, Agricultural Sub-Committee, and to the Agricultural Input/Output Study Group of that Sub-Committee. He also served as a member of a working party of the Agricultural Research Council which is studying the nutrient requirements of ruminants. Dr. Payne acted as Examiner in Agricultural Engineering for B.Sc.(Agriculture) and as Examiner in Agriculture for B.Sc. (Estate Management); he continued as a member of the Soils Sub-Committee for Colonial Agricultural, Animal Health and Forestry Research, and was Chairman of the Papers Committee of the Institution of Agricultural Engineers. Mr. Maddison acted as an Examiner for the National Diploma in Poultry and was a member of the National Poultry Diploma Board and of the Agricultural Improvement Council Poultry Committee. Both Dr. Payne and Mr. Innes acted as External Examiners for the National Diploma in Agricultural Engineering.

Staff Changes

Dr. Payne resigned his position as Lecturer in Farm Mechanization at the end of the session to take up a similar appointment at the University of Durham where he will be responsible for the development of a postgraduate course in Farm Mechanization. He will be replaced by Mr. R. D. Bell, B.Sc.(Engineering), A.M.I.A.E., A.M.I.(Agric.E.), at present Senior Lecturer in Agricultural Engineering at Gwebi Agricultural College, near Salisbury, Southern Rhodesia. Three vacancies were also established in the Department for Assistant Lecturers in Animal Production, Crop Production and Farm Mechanization. The vacancy in

Animal Production has been filled by Mr. Norman White, B.Sc. (Durham), and Mr. P. Hunton, B.Sc. (Durham), M.Sc. (London) was appointed as Assistant Lecturer in the Poultry Research Section.

Publications

- Holmes, W., and Sykes, J. D. (1960). "The influence of supplementary feeding in the summer period on feed intake and profitability of dairy cows." *Proc. 8th Int. Grassl. Cong.*, Reading. (In the press.)
- Holmes, W., and Osman, H. E. (1960). "The feed intake of grazing cattle. I. Feed intake of dairy cows on strip and free grazing." *Anim. Prod.*, **2**, 131-140.
- Holmes, W., Arnold, G. W., and Provan, A. L. (1960). "Bulk feeds for milk production. I. The influence of level of concentrate feeding in addition to silage and hay on milk yield and milk composition." *J. Dairy Res.*, **27**, 191-204.
- Castle, M. E., and Holmes, W. (1960). "The intensive production of herbage for crop drying. VII. The effect of further continued massive applications of nitrogen with and without phosphate and potash on the yield of grassland herbage." *J. Agric. Sci.*, **55**, 251-260.
- Murray, Marion W. (1960). "Results of the National Random Sample Test, Egg Quality." *Poultry World*. (In the press.)
- Murray, Marion W. (1960). "Heavy birds with black and barred plumage." *J. Brit. Broiler Growers' Assoc.*, **16**, 79-82.
- Payne, P. C. J., and Bailey, P. H. (1959). "Note on a Short Experiment on the Strength of Hop Anchors." *Rep. Dept. Hop Res.*, Wye Coll., 82.
- Wheeler, J. L. (1960). "Some effects of gang-mowing and nitrogenous fertilizer on a ryegrass/white clover ley." *J. Brit. Grassl. Soc.*, **15**, 252-258.
- Mundy, E. J. (1961). "The effect of urine and its components on the botanical composition and production of a grass/clover sward." *J. Brit. Grassl. Soc.* (In the press.)

Higher Degrees Awarded

The degree of Master of Science was awarded to Mr. A. G. H. Khattab for a thesis entitled "Some problems in the measurement of feed intake of grazing sheep", and to the following students in the field of Poultry Science. The titles of their dissertations are shown after their names.

A. J. Byng, "Some arthropoda associated with poultry, including a study of the litter fauna."

- M. F. W. Festing, "The effect of cleaning upon subsequent spoilage of hen eggs."
- J. N. Holt, "The energy/protein ratio and its significance in broiler nutrition."
- Miss P. M. Howe, "Ventilation and allied problems of deep litter laying houses."
- P. Hunton, "A study of some factors affecting the hatchability of chicken eggs, with special reference to genetic control."
- P. J. W. Lee, "A description of the effect of different housing and management factors on profitability in 'broilers'."
- K. M. Sharp, "The relationship between body weight and egg production in the domestic fowl, with particular reference to the Wye College flock."
- P. A. C. Thompson, "Egg size in relation to egg production as affected by selection, with special reference to the Wye College Rhode Island Red flock."

Lectures

- Professor Holmes. "Grassland management and utilization." N.A.A.S. Conference, Aberystwyth.
Ditto. University of North Wales, Agricultural Society.
"Grazing management." Farmers' meeting, Westerham.
"Grazing management for dairy cows." Yorkshire Grassland Society.
"The feeding of dairy cows." N.A.A.S. Conference, Reading.
- Dr. Payne. "Farm mechanization." Three lectures to Town Planning students at University College.
"Implements and cultivations." N.A.A.S. Conference, Doncaster.
- Mr. Maddison. "Hybrids versus purebreds." Worcester Poultry Conference.
"The work in progress in Wye Poultry Research Section." Chick Breeders' Association Refresher Course, Wye.
"Breeding better broilers." Annual Conference of Broiler Growers' Association.
"Flock structure." Poultry Breeders' Round Table.
- Dr. Duckworth. "Current work at Wye College Pig Research Section." N.F.U., Maidstone.
"Pig production." Sandwich County Secondary School.
- Dr. Jones. "Early fat lamb." Kent Farm Institute, Southborough.
- Mr. Innes. "Leys, seeds mixtures and seeding." Kent Farm Institute, Edenbridge.

“Rotations and peas” and “Straw crops and potatoes.”
Kent Farm Institute, Ashford.

“Recent developments in the field of cereal and potato
production.” I.C.I., Ashford.

Miss Murray. “Egg quality.” Chick Breeders’ Association Refresher
Course, Wye.

DEPARTMENT OF HORTICULTURE

Teaching

During the past year the course work in fruit culture was carried out against a gradually changing pattern of commercial enterprise, both in the College fruit plantations and in the fruit-growing industry. In the teaching increased emphasis is now placed on economic units of production and selection of variety for purpose, and propagation, pruning and tree control to suit local conditions. All these aspects are demonstrated in our orchards, nurseries and the special teaching plot C.

In vegetable crop husbandry and glasshouse production, and in market-gardening generally, the industry is experiencing an economic and technical upheaval. There is now an increased demand for disease-free seed and stocks of vegetables and flowers, and large-scale specialist producers are establishing themselves in various parts of this country and looking for Continental and overseas markets for their produce. During the early stages of these changes the College glasshouses and the related demonstration plots have served a most valuable purpose. Now, by switching over from static heated glasshouses to the full use of unheated mobile structures the Horticultural Department is sharing with the industry the uncertainty of this form of production.

In floriculture, too, the influence of a new and enterprising spirit is being felt and our participation in one of the newer trends, the use of mist techniques, has brought the College into much closer touch with the Nursery Trade, and our reports on this subject have been in great demand. Moreover, all sections of commercial horticulture are demanding men with some grounding in horticultural economics and management. These and related trends are stimulating a greater interest in commercial horticulture as a career.

The final examination results in July 1960 were most satisfactory. In a class of 19 students, 4 were placed in Division I, 8 in Division II, and 5 in Division III. There is no doubt that had an honours degree been available to them, some of these students would have acquitted themselves well in it. It is hoped that it may

prove possible to introduce an honours degree and so encourage those students who have special ability in the application of science to horticulture.

A party of 21 second year students visited the south-west and west of England during the first week of the summer vacation, accompanied by Dr. Wilkinson and Mr. Sykes. The programme was designed to enable the students to see the diversity of horticultural activities and interests associated with these regions. Visits were made to Long Ashton Research Station, the Evesham-Pershore district, the Cheddar strawberry region, a glasshouse nursery established by an old Wye student, and a large mushroom farm; visits were also made to cider apple and perry pear nurseries of Messrs. Showering's Ltd., the peat extraction and processing at the bogs of the Eclipse Peat Co. Ltd., and the arboretum and school gardens at Westonbirt.

Research and Investigation

Dr. E. H. Wilkinson and Mr. G. G. Thomas completed their study on fruit bud initiation, dormancy and propagation of blackcurrants and Mr. Thomas was awarded the degree of M.Sc. during the year.

Dr. Wilkinson and Mr. Arthey have made good progress with their investigation into the effect of nitrogen and water on the establishment of young dessert apple trees. The A.R.C. have supported this work and their help has been much appreciated. Dr. Wilkinson's work on the bitter rot fungi, *Gloeosporium* spp., is proving of special interest and a short paper with Dr. D. M. Spencer was published during the year. Plantation and laboratory work is being carried on and it is hoped to obtain further information, particularly on *G. album*. Dr. Wilkinson has also initiated observations on the effects of meteorological and chemical injuries on the primary foliage of apple.

In his work on crop improvement Mr. A. A. Jackson has had the collaboration of Mr. S. Beresford, and has completed the first part of a study of the environment of the mother plant in relation to seed quality and germination. The nutrient status of the soil has been shown to have an important influence on the behaviour of the seed. Some strains of vegetable crops produced in the Department are now in commercial use and others are undergoing trial by the N.I.A.B. Special interest attaches to a new Wye Brussels sprout in its first year of trial.

Investigations into the management of mobile glasshouses are being continued and the Department is indebted to Dr. Wibberley and Mr. Folley for helpful discussions of the Department's data.

Mr. J. T. Sykes and Mr. B. Howard have continued their studies of *Syringa* and *Diervilla* species and cultivars. They have investigated the effect of extended daylength on material from their stock plants and are accumulating results likely to be of special interest to nurserymen. Mr. Sykes has also continued to use mist propagation techniques for the multiplication of garden forms of *Prunus* not previously produced commercially on their own roots.

Staff

Miss Elizabeth Emmerson, B.Sc.(Hort.), resigned her position as Demonstrator, on marriage. Mr. J. Parker retired from the position of head gardener at Withersdane in September 1959. He had served the College well during the difficult post-war years when a long period of neglect had left the gardens in a sorry condition. Under his care they gradually assumed a high standard of maintenance and students and staff will long remember his unfailing help and courtesy.

Mr. E. Sheppard was appointed as head gardener at Withersdane in October 1959 and took over responsibility for the College gardens and conservatories. He has brought valuable and varied experience with him, gained both in this country and in Canada.

The senior members of the Department have assisted as usual with the University of London examinations and in addition Professor Miles and Dr. Wilkinson acted as External Examiners at Glasgow and Reading respectively. Mr. Jackson has acted as examiner for the R.H.S. at certain of the Farm and Horticultural Institutes.

Extra Mural Activities

Mr. Jackson attended an International Colloquium on Chicory culture at Gembloux, Belgium, and Dr. Wilkinson visited Western Germany as the guest of Messrs. Beechams Foods Ltd. to study the methods and scope of blackcurrant culture. Professor Miles visited the Isles of Scilly to take part in a conference on the special marketing problems of those islands.

Several members of staff assisted with the horticultural lectures to students taking the course in Landscape Design at University College. Help was also given to the University Summer School held at Wye in August 1959.

Mr. Jackson lectured to the South Holland (Lincs.) Growers' Club, and he also attended a meeting of the British Standards Committee on Seeds, as the College representative.

Visitors to the Department have included members of the N.A.A.S., local growers and their staffs, visitors from overseas,

staff and students from the Kent Farm and Horticultural Institute, and horticultural students from the Canterbury Technical School. The gardens at Withersdane were again thrown open on two occasions during the summer under the National Gardens scheme.

Mr. Lewis, the Commercial Manager, continues to help local horticultural societies in their work by giving them occasional demonstrations of newer garden practices and by acting as judge. The services of Mr. Lewis and members of his staff in the latter capacity are in considerable demand.

Publications

- Spencer, D. M., and Wilkinson, E. H. (1960). "Further experimental work on *Gloeosporium*." *Plant Pathology*, **9**, 49.
 Jackson, A. A. (1960). "The cultivation of sweet corn." *Grower*, 23rd April.
 Sykes, J. T. "Plants and parks of Greece." *Gardeners' Chronicle*, **147**, Nos. 6 and 7.
 Sykes, J. T. "Garden shrubs from New Zealand." *Gardeners' Chronicle*, **148**, No. 5.
 Emmerson, Elizabeth. "Interesting shrubs at Wye College." *Journ. R.H.S.*
 Miles, H. W., and Sykes, J. T. (eds.). "Proceedings of the Wye Conference on Mist Propagation." *College publication*.

Gifts of Plants

The Department is grateful for the following gifts of garden and greenhouse plants of particular interest:

<i>Jacaranda ovalifolia</i>	Miss D. E. Pomeroy (Aldington).
Tree tomato, <i>Cyphomandra betacea</i>	} from New Zealand.
Kauri pine and <i>Edwardsia microphylla</i>	
<i>Punica granatum nanum</i>	from U.S.A. (Professor Miles).
<i>Urgenia maritima</i>	} from Greece (Mr. J. T. Sykes).
<i>Scilla autumnalis</i>	
<i>Lotus bertholletii</i>	} from the Canary Isles (Mr. Edward Hyams).
<i>Thevetia peruviana</i>	
<i>Canarina campanulata</i>	
<i>Dracaena draco</i>	
<i>Puya chilensis</i>	Lady Nicolson.

The collection of house plants has been improved by exchange with the Hertfordshire Horticultural Institute at Oaklands.

DEPARTMENT OF BIOLOGICAL SCIENCES

Teaching

In the Agriculture Honours degree course three students elected to present special studies in the botanical field and all reached a very high standard. The value of the "special study" was emphasized by the fact that one of these students has been able to carry forward this interest in a more specialized field, viz. insect transmission of plant viruses, by proceeding to higher degree work in the subject at Cornell University, U.S.A. It is hoped that the degree courses may become less specific in their demands to allow for such unusual interests which often develop rather late in the College career of the student.

For the first time at Wye second year Honours students have been able to study the principles of Mendelian inheritance, chromosome mapping, gene interaction and the physiology of gene action in families of live mice. The enthusiastic response of students to this new type of work was most gratifying and must inevitably lead to the demand for roomier and more permanent quarters for the subjects of the exercise.

In the Autumn Term Dr. Nutman, Head of the Department of Soil Bacteriology at Rothamsted, kindly gave a special lecture to second and third year students on his work with the N-fixing bacteria of the legumes.

Sincere thanks are due to Mr. D. van Konynenberg of the Spalding Bulb Co., for a generous gift of tulip bulbs to facilitate our class studies of flower initiation and development.

Research

A grant of 7,200 dollars was awarded to the Department by the Rockefeller Foundation early in 1960 for the purchase of special research equipment, primarily in connection with the development of physiological studies of the host-pathogen relationship between the fungus *Verticillium* and the tomato plant, which was begun by Dr. Selman and Dr. Pegg. Through the courtesy of Professor F. W. Yemm, Dr. Pegg was enabled to spend a week in the Department of Botany at Bristol University, studying recent techniques of amino acid analysis. Mr. Milne has completed studies of the cyclical changes in infectivity which occur when a tomato plant is infected with spotted wilt virus and has discovered virus-inhibitor systems which may be related to such changes.

The appearance of a very fine crop of sweet peas in the Botany Garden marked the initiation of a survey of the virus diseases

affecting the sweet pea which has been started by Mr. Hill. These diseases are of serious concern to growers and we are indebted to Mr. George Unwin and other growers for material and advice in this connection. The effects of far-red radiation and gibberellic acid on plants infected with spotted wilt virus are being studied by Mr. E. Sid Ahmed, a research student from the University of Khartoum.

In November 1959 we were pleased to welcome Dr. R. J. Best of the Waite Institute, Adelaide, who gave to the staff of the Department a lively account of his work on biological recombination (or "hybrids") between strains of tomato spotted wilt virus.

In the zoological field, Dr. Ede is continuing his studies on the effects of viruses of the fowl leucosis complex on differentiating cells with the object of obtaining information both on the extent of genetic and environmental variation in these viruses and on the cell-virus relationship under various experimental conditions. In connection with this work, he was awarded a British Council Scholarship enabling him to make an extended visit to the University of Tübingen. With Miss Rogers, he is also studying the production and analysis of embryonic lethal mutants in the beetle *Dermestes maculatus*. The object of this work is to obtain information on the possibilities of obtaining mutations in insects other than *Drosophila*, which has been extensively studied elsewhere in this connection, and also to investigate the physiology of gene action in controlling developmental processes in insects. Mr. Kelly continued his work on the morphological and experimental analysis of the effects of a lethal gene ("talpid") on the development of the chick embryo.

Extra Mural Activities

Dr. Ede and Mr. Kelly gave a colloquium on their researches into the effects of the lethal gene "talpid" on the development of the chick embryo at the Department of Anatomy, University College, London. Dr. Selman has served as Chairman of the Board of Studies in Agriculture and Horticulture, as a member of the Board of Studies in Botany and on the Governing Body of the College. Mr. Harrison again organized a series of documentary film shows for members of the College in the Winter Terms. He also acted as Botanist for the students' farm tour to Northumberland and has served on the Board of Studies in Agriculture and Horticulture.

It was with unusual pleasure that we were able to arrange for Professor Lewis, with 18 staff and students from the Botany Depart-

ment, University College, London, to inspect the teaching experiments in genetics with mice and primulas, which are given annually to our own classes.

Staff

M. R. Brierley, who held the Fison Research Fellowship in the Department for $2\frac{1}{2}$ years, was awarded the degree of Ph.D. for a thesis entitled "Changes in the free amino acid content of tomato plants inoculated with tomato spotted wilt virus". He left in March 1960 to take up an appointment with Beechams Ltd. Miss Anne Rogers resigned from the post of Demonstrator in Zoology on 1st August 1960 to get married. She is succeeded by Mr. J. Hinchliffe, B.A. Mr. Milne has resigned to take up a post in plant virus research in the Botany Department, Oxford. The appointment of Dr. G. J. Dowrick of the John Innes Horticultural Institution as Lecturer in Genetics and Plant Breeding filled a long-felt gap in the staffing of the botanical side of the Department. Our sincere thanks are due to Mr. R. Neve of the Hop Research Department who, in spite of research commitments, has for some years been responsible for the teaching of Plant Breeding. Dr. M. D. Hooper and Mr. R. Hull, B.A., have been appointed respectively Assistant Lecturer and Demonstrator in Botany as from 1st October 1960.

It was with the deepest regret that we learnt of the death from polio of Dr. Maurice Froud in Ghana in October 1959. Dr. Froud had been in charge of Zoology teaching in the Department from 1946 to 1957 and will be long remembered for his painstaking work in establishing courses of Agricultural Zoology worthy of a Science Department of the University.

Examinations

Dr. Selman again acted as a University Examiner for the overseas Colleges in Special Relation, viz. U.C. Ghana, U.C. Ibadan, and U.C. Makerere; as Chairman of Examiners for the First Examination in Agriculture and Horticulture and for the Final Examinations in Agriculture and Horticulture. Members of the Department also served as Examiners for the several University Examinations in Agriculture and Horticulture.

Publications

- Froud, M. D. (1959). "Studies on the arterial system of three inbred strains of mice." *J. Morphology*, **104**, 441-478.
Kelly, W. A. (1960). "Passage of insulin through the wall of the gastro-intestinal tract of the infant mouse." *Nature*, **186**, 971.

DEPARTMENT OF PHYSICAL SCIENCES

Teaching

The provision of the new laboratories which were brought into use at the beginning of the Summer Term resolved most of our teaching problems. The Department is now accommodated as a single unit around a pleasant grassed quadrangle and in addition to adequate teaching and research laboratories there is a lecture theatre well equipped for demonstration work. The teaching of Geology, Pedology and Physics has been greatly facilitated, these subjects for many years having been taught under conditions which were quite inadequate. The new Chemistry laboratory meets the needs of all soil chemistry and animal nutrition classes as well as those of physical chemistry for Honours students.

No major modifications have been made in the structure of the teaching courses, though in first year work, whilst still maintaining a basic approach, there is an increasing tendency to emphasize those aspects which are of importance in the second and third years. It may be noted that many students who have taken Advanced level Chemistry at school are still weak in fundamentals and have difficulties in their first year studies. On the other hand, some students show a greater interest in scientific than agricultural aspects; it is felt that the needs of such students could be better served by a degree in Agricultural Science.

The usual geological excursions were arranged for first year students and field classes in Pedology were held for second year Agricultural Honours and Horticultural students. In collaboration with the Department of Agriculture of Durham University, Mr. Askew conducted a field course on Soils in Lancashire during September. Classes in Biochemistry and Nutrition for Poultry students reading for the M.Sc. degree were re-organized and several of these students chose a chemical topic as the subject of their Special Study.

Facilities provided by the National Agricultural Advisory Service were used on various occasions and student visits were arranged to their soil, plant and microbiological sections. Members of the staff of the Agricultural Research Council Unit assisted in teaching work by providing demonstrations of infra-red and ultra-violet absorption spectroscopy and other up-to-date techniques.

Research

The broad lines of investigation for which the department is becoming well known have continued and close collaboration has

been maintained between teaching staff and the staff of the Agricultural Research Council Unit. The studies on plant growth regulation have now reached a stage where the biological properties of a molecule can to some extent be predicted from a consideration of its chemical structure. Such work has again led this year to the discovery of new active compounds, some of which may be of agricultural importance. All the research proceeding within this field depends upon the provision of uniform biological material and on this account it has proved necessary to enlarge the constant temperature room within the A.R.C. Unit. With the expansion of the biological investigations on systemic fungicides, growth substances and related metabolic studies, the small laboratory used for this work became grossly overcrowded and inadequate. This situation, however, was greatly improved during the year by the building of another laboratory for plant physiological studies. This new laboratory links the Chemistry and Biological laboratories of the Unit.

Thanks are again due to May & Baker Ltd. and to Shell Chemicals Ltd. for supporting investigations within the Department by the continued provision of their Research Fellowship and Scholarship respectively.

Dr. Smith has carried out syntheses incorporating heavy hydrogen into the molecule of the plant growth substance 2:4-dichlorophenoxyacetic acid with a view to studying the influence of this atom on the physiological activity of the molecule. Further resolutions of optically active growth substances have been carried out. Mr. Garraway has made excellent progress in his work on fungicides. A large number of new compounds have been synthesized and their mode of action as fungicides is being investigated. Dr. Rutherford has studied the influence of growth-regulating compounds on water uptake of certain plant tissues and has used physical and chemical methods to follow metabolic changes within the cell which control this phenomenon. In this work he has had some assistance from Mr. Weston. Mr. Williams has continued his investigations on the metabolism of various phenoxy acids in rats. Mr. Askew has now completed his field studies on Romney Marsh and is writing up his work. Mr. Dalrymple has also completed his researches on the brickearths of Kent and his Ph.D. thesis is now with the University.

Dr. Fawcett has continued his experiments with the anti-fungal material present in broad bean seedlings. The material has proved very difficult to obtain in the pure state and its structure remains to be elucidated. Dr. Rothwell has been collaborating with Mr. Van Steveninck, a visiting research worker from King's

College, London, on the extraction, isolation and identification of a potent hormone inhibitor present in lupin pods. The Craig counter current extraction apparatus has proved most useful both for this investigation and for the work on the bean antibiotic. Dr. Wright has commenced work of fundamental physiological importance designed to examine the possible interaction of gibberellins, kinins and auxins in the growth of plant tissues. Promising results are being obtained in this work. Dr. Spencer has collaborated with Dr. Fawcett in the work with the bean antibiotic and continued his investigations on the fungicidal properties of root exudates. Mr. Carter is making a comprehensive study on the influence of various ions, supplied through the roots, on the resistance of tomato and bean plants to pathogenic fungi. Mr. Taylor, continuing his work on the breakdown of phenoxy acids by certain bacteria isolated from soils, has shown an interesting similarity between plant and bacterial metabolism. Mr. Cozens, responsible for much of the bioassay work on growth substances, has provided valuable assistance to members of the teaching and research staff throughout the year.

Mr. Ayed, a research student, has continued his studies on the influence of chelating compounds on the uptake of nutrient elements by plants and has extended his work to include changes in certain organic constituents arising from such treatments. Miss Macdonald has studied the effects of ethylene treatment on the growth hormone content of tomato plants and is carrying out investigations on the selective toxicity of various chemicals to germinating seeds.

Examinations

Professor Wain, Dr. Smith and Mr. Askew were appointed examiners for the degrees of B.Sc. (Agriculture) and B.Sc. (Horticulture) of the University of London. They also acted as examiners for degrees, awarded in Special Relationship with London, at University Colleges overseas. These now include those in Nigeria, Ghana, Uganda and Rhodesia. Professor Wain and Dr. Smith acted as examiners for Higher degrees in a number of Universities, and Professor Wain was External Examiner for the B.Sc. degree in the University of Glasgow. Both Professor Wain and Mr. Askew were External Examiners for the degree of B.Sc. (Agriculture) of the University of Khartoum.

Staff Changes

Dr. Mattok left the Department in September 1959 to take up a research appointment in Canada and his post of Assistant Lecturer in Chemistry was taken by Dr. P. P. Rutherford from the

University College of North Staffordshire. Mr. Garraway, May & Baker Research Fellow, was appointed Assistant Lecturer in Chemistry in place of Dr. Beryl Rickard. Mr. Weston joined the Department as analyst in place of Mr. Carling who took up an appointment as Lecturer at the College of Food Technology at Weybridge. Dr. Clarke left the A.R.C. Unit on his appointment to the staff of the Plant Pathology Laboratory at Harpenden and he was succeeded by Dr. Rothwell from the University of Hull. Miss Macdonald joined the Department as a Research student in October 1959. By arrangement with Professor T. A. Bennet-Clark, F.R.S., of King's College, one of his research students, Mr. Van Steveninck, spent the year in the Department carrying out work in collaboration with members of the A.R.C. Unit. Dr. Simpson and Dr. Dye, two New Zealanders, left the Department early in the Session on the completion of their research and the award of the Ph.D. degree.

Extra Mural Activities

Professor Wain went to Poland in July at the invitation of the Polish Academy of Sciences and visited Research Stations, Universities and several State-owned chemical organizations. During the year he served as a member of the Visiting Group appointed by the Agricultural Research Council to report on certain Departments at Rothamsted Research Station.

Dr. Smith and Professor Wain continued to serve as members of the University Board of Studies in Agriculture and Horticulture. Professor Wain also served on the Boards of Studies in Chemistry, Botany and Veterinary Science and on the Board of the Faculty of Science. He continued as a member of the Agricultural Research Council's Standing Committee affecting Plants and Soils, the Agricultural Panel of the Colonial Advisory Council of Agriculture and the Colonial Pesticides Research Committee. He was also appointed a member of the Agricultural Research Council Committee for Hop Research. He continued as a member of the Governing Body of the Glasshouse Research Station and was appointed Chairman of the Research Committee during the year. He also served on the Council of the Royal Institute of Chemistry and as a member of other Committees. He acted on a number of occasions as a member of Selection Committees for overseas appointments and for the award of Agricultural Research Council postgraduate scholarships and University postgraduate studentships.

Mr. Askew attended the Conference of the Soil Science Society at Edinburgh and two conferences of the Geologists' Association. He served on the Selection Committee for appointments at the

University College, Ghana, and gave a lecture on "The Geology of East Kent" at the Conference of Advisory Bacteriologists held at Wye during September. Mr. Taylor gave a paper on "The breakdown of certain phenoxy acids by organisms isolated from soil" at the same conference.

Dr. Spencer gave a lecture on "Volatile fungicides and their possible use in crop protection" at the Colonial Mycological Conference in London in July, and Dr. Wright gave a paper on "Some new observations on the roles played by gibberellic acid, indole-3-acetic acid and kinetin in plant growth" at the Society of Experimental Biology Conference held at Hull in July. Mr. Dalrymple attended the International Geological Congress in Copenhagen in August. Mr. Williams organized a course of four scientific lectures for VIth form pupils of Ashford Grammar School; Dr. Wilkinson, Dr. Wibberley, Mr. Jackson and Mr. Williams took part. Dr. Smith, Mr. Garraway, Dr. Rutherford and Professor Wain assisted at courses of the University Summer School held in Wye in August.

During the session Professor Wain gave the following lectures:

- "The chemical control of plant growth." Chemical Society, University College, London. (October 1959.)
- "Some recent research on plant growth substances." Biological Society, University of Liverpool. (October 1959.)
- "How plants grow." Christmas Lecture for Science VIth formers arranged by the Royal Institute of Chemistry. Given on two occasions at the University of Bristol. (January 1960.)
- "Chemical structure and biological activity." Chemical Society, University of Nottingham. (February 1960.)
- "Chemical aspects of plant disease control." National Vegetable Research Station, Wellesbourne. (March 1960.)
- "Plant growth-promoting substances—some analytical aspects." Society of Analytical Chemistry, University of Birmingham. (March 1960.)
- "Some impressions of East and West Africa and the West Indies." University Summer School, Wye College. (August 1960.)
- "New developments in crop protection." Ministry of Chemical Industry, Ministry of Agriculture and the Chemical Society of Poland, University of Warsaw. (August 1960.)
- "Recent research on the regulation of plant growth with chemicals." The Hannah Dairy Research Institute, Ayr. (September 1960.)

Collaboration on research problems has continued with the Medical Research Council and many centres overseas. The Depart-

ment staged a research exhibit at the Royal Society Conversazione arranged in connection with the Tercentenary Celebrations in July.

Professor Wain was elected a Fellow of the Royal Society and awarded the Research Medal of the Royal Agricultural Society of England during the year.

Publications

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- Clarke, G., Dye, M. H., and Wain, R. L. (1959). "Occurrence of 3-indolylacetic acid and 3-indolecarboxylic acids in tomato crown gall tissue extracts." *Nature*, **181**, 825.
- Wain, R. L. (1960). "Chemotherapy for plant diseases." *New Scientist*, **7**, 41.
- Pizey, J. S., and Wain, R. L. (1959). "Pre-emergent herbicidal activity of some substituted amides and related compounds." *J. Sci. Food and Agric.*, **11**, 577.
- Taylor, H. F., and Wain, R. L. (1959). " α -oxidation of indole-acetonitrile." *Nature*, **184**, 1142.
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- Arman, P., and Wain, R. L. (1960). "Studies on the copper fungicides. XI. Absorption of soluble copper in relation to stage of leaf growth and to leaf injury." *Ann. appl. Biol.*, **48**, 392.
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- Weston, E. (1960). "Sex changes in the hop caused by plant growth substances." *Nature*, **188**, 81.
- Plesh, P. H., and Rutherford, P. P. (1960). "Viscometric studies on polyisobutene solutions." *Polymer*, **1**, 271.
- Clarke, K., and Rothwell, E. (1960). "A kinetic study of the effects of substituents on the rate of formation of alkylpyridinium halides in nitromethane solution." *J. chem. Soc.*, p. 1885.
- Smith, M. S. (1960). "Fertilizers." *Encyclopaedia Britannica Year Book*, p. 206.

DEPARTMENT OF AGRICULTURAL ECONOMICS

Teaching

In the first year at College all students receive certain background lectures relating to agrarian history and development. In the second year, courses in the basic economic principles are now taught in the three degrees available at the College, and these are then applied, during the second and third years, to the broad problems of agricultural organization, policy, marketing and prices and to the management of individual farms and horticultural holdings.

Research and Investigation

Land Economics. Three departmental publications marked an important stage in the development of these studies. *Agriculture and Urban Growth* (G. P. Wibberley) showed how little under control was the process of allocating agricultural land to non-agricultural use. Supported by *The Major Land Uses of Great Britain* (R. H. Best) it made clear that the rate of usurpation of farm land had been officially understated, and that there was need to study the ways in which food lost from "developed" land could be replaced: to this end, more rational economic decisions were required by planning authorities and tribunals; by adopting market and social rates of discount in capitalizing the value added by farm use, the social consequences of alternative plans for the development of farmland could be evaluated. Mr. Best concentrated his studies upon the nature, accuracy and compatibility of land use statistics, and concluded that the agricultural returns made annually by farmers were not a satisfactory means of following the national pattern of changes in land use. *Farm Rents and Tenure* (J. T. Ward) discussed recent changes in the pattern of agricultural land tenure in Great Britain, analysed recent legislation dealing with the land-

lord-tenant relationship and made an assessment of alternative methods of tenure.

It is intended that work in land economics will continue, with some slight change of direction. Cost/benefit studies will now be confined to alternative modes of use of rural land, paying attention to the relative efficiency of different forms of subsidization and grant-aid to British farming. Land-use trends in Britain are being critically compared with those in Holland and the U.S.A. Changes in agricultural rents and farm values over the past century are also being measured and evaluated.

Horticultural economics. No new production studies were started during the year. The main research effort was directed towards securing a more complete picture of the structure of the industry and of its economic strengths and weaknesses. In *Commercial Horticulture in Britain: its Character and Competitive Strength* (R. R. W. Folley) it has been shown that open-ground (or in-season) production is the backbone of British horticulture, but not of producers, because open-ground production generally takes place on mixed farms. Early-season, and out-of-season production, are more often in the hands of specialists; and for this reason the specialists are more economically vulnerable to freer trade in horticultural production. Because of institutional and other reasons the impact of freer trade upon supplies and prices in Britain is likely to be slighter than many observers at first thought.

W. L. Hinton carried the structure aspect a stage further with studies into the size and character of horticultural output in the different regions of England and Wales. Whilst the south-east was the most intensive area, the magnitude of production was highest in the eastern counties.

In the report *Investment in Orchards* (R. R. W. Folley and K. C. Yates), the authors showed that close initial planting of fruit trees was found to be advantageous in bringing quicker and earlier profits to the grower. In all decisions, however, long-term considerations should be given preference over short. This report was based on the recorded experiences, over 10 years, of a large-scale and thoughtful fruit grower.

A start was also made in the interpreting of orchard accounts which have been prepared for a mixed sample of growers for 10 years. Similarly, yield data for the period 1948-57 is being written up. There are no indications that yields of mature trees increase as the trees approach middle life, and this must affect growers' policy decisions. A shorter enquiry into the prospects for culinary apples is being prepared with the object of seeing how production can best be adjusted to declining prices. Research into

the economic aspects of control of yield, using field techniques and observing physical and physiological data, is also being planned.

Farm economics. The report *Farm Business Statistics* (J. D. Sykes) embodied the management standards and efficiency data for groups of farms of separate type and size in south-east England. These were obtained by analyses of the Farm Management Survey records. Each co-operating farmer is sent each year a short appreciation of his business results.

The official Milk Cost Scheme was resumed, using a sample twice as large as on the last occasion. Messrs. G. Allanson and J. D. Sykes have also been engaged on a research project of national scope concerning efficiency in milk production based upon the concept of the "feed economy" as a dependent variable. The study is concerned with how feed for the dairy herd can be provided most advantageously on modal types and sizes of farm.

During the year J. D. Sykes collaborated with Professor W. Holmes in the preparation of a research paper for the 1960 International Grassland Congress. This embodied the results of a study of the national milk cost data for recent years in relation to the economic worth of the supplementary feeding of concentrates to dairy cows during summer months. No economic gain could be established for such a practice.

An exhaustive examination of the economic prospects of the Kent or Romney Marsh breed of sheep was concluded (G. Allanson). To market heavy carcasses of mature animals is not the best practice under present price and subsidy arrangements; this was the traditional Romney Marsh practice: to get younger sheep to market weight earlier will necessitate changes in Kent sheep farming systems.

The enterprise studies carried out dealt with potatoes, fat cattle, tractors and poultry. Records from potato growers in two contrasting areas—the Hoo Peninsula and Romney Marsh—were obtained, and special attention was given to the role and efficiency of labour use and potato harvesting machinery (B. Hardaker). Some sixty farmers are co-operating in the survey of tractor costs. The poultry enquiry will be carried out with the intention of establishing relationships between egg production cycles, egg size and hatching dates.

E. S. Clayton, in his *Studies in Beef Production*, gave a detailed account of four different systems of producing beef in order to show how the choice of the "best" system depends so much on the peculiarities of the individual farms. The studies also demonstrate the value of knowing accurately the growth rates of the animals being kept.

Staff and Postgraduate Changes

Mr. Hinton resigned on his appointment as Horticultural Liaison Officer for the Eastern Province, and Dr. J. T. Ward resigned his post as Lecturer in order to take up a position as Senior Lecturer at Lincoln College, Christchurch, New Zealand. Mr. G. J. Tyler was promoted to Lecturer Grade B.

Six months' in-service training was provided, for the Colonial Office, to Messrs. Clough and MacArthur before they took up posts as Farm Economists with the Government Service in Kenya. Mr. Shamsul Islam of Pakistan was admitted to read for a Ph.D. degree under a special fellowship awarded by the American Council for Economic and Cultural Affairs (Rockefeller Foundation).

Advisory Work

Many lectures were given to farmers' groups and conferences, both within and without the south-east of England. Many more farmers are now visiting the Department to talk over their management problems with the Liaison Officer, often with a third party such as their local bank manager or their District Officer. Estate agents, prospective tenants, land planning officers and others interested in land problems are also frequent visitors to the College.

Recording and accounting methods for the College Farm and commercial Horticultural Department are continually being improved, so that the Department can give a better service in its yearly appraisal of financial results. A report dealing with management accounting and farm planning for the larger farm is being prepared (J. D. Sykes and I. G. Reid).

In connection with the Horticultural Improvement Scheme, a memorandum on "Tests of Worthwhileness" was prepared in collaboration with the local N.A.A.S., to be circulated to all centres for a trial period.

During 1959/60 the pattern of the farm management work has followed the lines foreshadowed in the past report. Pre-occupation by the N.A.A.S. in the execution of the Small Farmer Scheme has meant comparatively little joint work from this source, except from some Advisory Officers who have shown particular aptitude and interest in management problems. The need for a formal presentation of farm management plans and budgets has also come about through the activities of the newly-established Agricultural Credit Corporation. This has meant further farm management work for the District Advisory Officers, which has apparently been taken in their stride. Direct contact by farmers and other ancillary professions has continued to increase. More requests are coming from the larger farmer wishing to discuss aspects of

farm policy as well as of farm operation. One problem, which has arisen on several occasions and will arise more frequently in the future, is that of increasing land values in south-east England. Prices being asked and offered make certain farms viable only when considered as long-term property ventures rather than as straightforward farming businesses. This may well lead to greater liaison with land agents and surveyors.

The number of outside lectures has been maintained, the majority being concerned with series of talks on farm records and accounts (Messrs. Tyler and Reid). Mr. I. G. Reid has also been concerned with the development of an examination syllabus in Farm Organization and Management for the City and Guilds Institute of London. 1960/61 is likely to see developments in farm management techniques which will move away from the emphasis on "the whole farm" approach towards assessments of the contribution made by individual enterprises. Such an approach was demonstrated, in an elementary fashion, in the techniques devised for making plans under the Small Farmer Scheme. It has now been further developed and would seem to be ready for wider circulation and application (G. Tyler). The data used for farm management purposes has now been published in book form under the title *Farm Business Statistics of South East England*, by J. D. Sykes. The method of farm classification has been considerably developed and has made comparative analysis that much more useful.

Extra Mural Activities

Dr. G. P. Wibberley was University examiner in Economics and Agricultural Economics for internal degrees in London and external degrees at the University Colleges of Ghana, Nigeria, East Africa and Rhodesia and at the independent Universities of Khartoum and Ceylon. He was a member of Inter-University Council selection boards for University and research posts in Africa, and visited the University Colleges of Ghana and Nigeria for the University in May/June 1960. He also acted as a member of the Boards of Studies in Economics, Agriculture, Geography and Estate Management in the University and on the Executive Committees of the Agricultural Economics Society and the Town and Country Planning Summer School. His main outside lectures were to the N.A.A.S. at Sunningdale in November 1959, at the University of Reading in January 1960, at University College, London, in February 1960, and at the London School of Economics in March 1960.

Mr. R. R. W. Folley served as a member of the Board of Studies in Economics in the University and was an assessor in the final examinations of the B.Sc. degree in Horticulture. In December 1959

he gave a paper to the Agricultural Economics Society. Mr. I. G. Reid was a member of the Board of Studies in Agriculture in the University and served as an assessor in Farm Management in the B.Sc. and B.Sc.(Honours) degrees in Agriculture. He acted as an external examiner in Farm Management for the postgraduate diploma at the University of Reading and at the Essex Institute of Agriculture. During the year he was appointed to serve on the Agriculture Committee of the Agricultural Improvement Council, and assisted the syllabus committee on Farm Management for the City and Guilds of London Institute. He gave 15 advisory lectures in south-east England during the year, with 2 others outside the region, and 1 broadcast talk.

Mr. J. D. Sykes was appointed a Recognized Teacher of the University in December 1959. He acted as an assessor in Agricultural Economics for the B.Sc. and B.Sc.(Honours) degree examinations in Agriculture, and between June and September 1960 made an exchange visit to the Ontario Agricultural College, Canada (Department of Agricultural Economics). Mr. J. T. Ward was an assessor in Agricultural Economics for the B.Sc. and B.Sc.(Honours) degree examinations in Agriculture, and during the year gave a series of lectures in Agricultural Economics at the College of Estate Management in London. He was awarded a Ph.D. degree in the University in July 1960. Mr. G. Allanson lectured to one conference and three farmers' groups on Sheep Economics during the year, and Mr. W. L. Hinton gave a lecture course on the Economics of Horticulture at the Kent Farm Institute. Mr. R. H. Best became a member of a newly-instituted University geographical research group concerned with types of farming studies, and also organized and led a geographical study tour for the VIth forms of East Kent schools. Mr. G. J. Tyler gave two courses of lectures on Farm Records and their use at Steyning and Dover, and a new lecture course on Farm Management at the Kent Farm Institute.

Books :

"Agriculture and Urban Growth," G. P. Wibberley. Michael Joseph Ltd. January 1960.

"Agricultural Economics," G. P. Wibberley.

"Estate Economy," J. T. Ward. Chapters in *Rural Estate Management*, 3rd edition, edited by R. C. Walmsley. Estates Gazette Ltd. May 1960.

Reports :

"Tomatoes—the Dutch Way," R. R. W. Folley. Fruit & Vegetable Products Ltd., London. October 1959.

Departmental reports :

- "The Major Land Uses of Great Britain," R. H. Best. September 1959.
- "Investment in Orchards," R. R. W. Folley and K. C. Yates. February 1960.
- "Farm Business Statistics for South East England," J. D. Sykes. April 1960.
- "Commercial Horticulture—its Character and Competitive Strength," R. R. W. Folley. March 1960.
- "Studies in Beef Production," E. S. Clayton. June 1960.

Articles :

- Best, R. H. "The Statistical Pattern of Land Use in Great Britain," *Geography*, **44**, July 1959.
- Best, R. H. "Is Your Return Really Necessary," *Farmer & Stockbreeder*, 7th June 1960.
- Best, R. H. "The End of the City," *Town & Country Planning*, **28**, July 1960.
- Clayton, E. S. "Need for New Egg Price Policy," *Farmer & Stockbreeder*, November 1959.
- Clayton, E. S. "It Pays to Keep Them Laying," *Farmers' Weekly Poultry Supplement*, January 1960.
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- Folley, R. R. W. "Commercial Horticulture in the British Economy" and "Capital Investment in Horticulture," *Journal of the Agricultural Economics Society*, **14**, No. 1, June 1960.
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- Ward, J. T. "Equities versus Farms," *The Financial Times*, 15th February 1960.
- Ward, J. T. "What Shall I Tender," *Farmer & Stockbreeder*, 1st March 1960.
- Wibberley, G. P. "Broadley Farm and the Black Mountains," *Farmers' Weekly*, September 1959.
- Wibberley, G. P. "British Agriculture in the 1960s," *Agricultural Supplement, West Sussex Gazette*, February 1960.
- Wibberley, G. P. "Urban Sprawl and Food Replacement," *Farmer & Stockbreeder*, March 1960.
- Wibberley, G. P. "Changes in the Structure and Function of the Rural Community," paper prepared for the European Congress of Rural Sociology, 28th July-4th August 1960. Oslo, Norway.

DEPARTMENT OF HOP RESEARCH

The application of new techniques and increased collaboration with other research teams are enlarging the scope of the Hop Department to give a wider spectrum of research activities. In addition to encouraging progress in more familiar lines of work, the year under review has seen fresh ground broken in a number of important projects including studies on the carbohydrate balance of young hop plants, investigations on the over-wintering of downy mildew disease and field trials on the yield load of hop anchors. These and other topics are dealt with in full in the recently published Annual Report of the Department which covers the year ending 31st March 1960.

The acreage of hops under wirework in the College gardens, which was much reduced in recent years by the loss of Wye field through Progressive *Verticillium* Wilt, has returned to its 1955 level of 22 acres. A high proportion of this is already involved in plant breeding research and in other trials; the pressure by scientific staff for space for further field experiments to confirm the results of their laboratory investigations is both welcome and embarrassing.

The 1959 College hop crop which was sold during the year under review was of good quality and was valued in the grade one and grade one plus bonus classes. Its resin content was surprisingly low considering the amount of sunshine the plants received during their growing and ripening period. The 1960 crop has made heavy growth and preliminary indications are that yields will be high; quality has yet to be assessed.

Mr. E. G. Cripps, who was with the Department since its formation in 1947, retired through ill health in December 1959. In the same month Mr. E. W. Weston transferred to the Physical Sciences Department of the College; he was replaced as chemist by Mr. J. B. Roberts who was appointed in February 1960. Mr. M. W. Shea was appointed in August 1960, as Experimental Officer for research in hop engineering; he is on permanent secondment to the National Institute of Agricultural Engineering at Silsoe, Bedfordshire. The Guinness postgraduate fellowship was awarded in August 1960 to Mr. J. B. Smithson for research in hop genetics.

Grateful acknowledgements are again due to the Agricultural Research Council, the Hops Marketing Board and the Institute of Brewing for their continued support and encouragement. Thanks are also expressed to the National Institute of Agricultural Engineering, East Malling Research Station, the National Agricultural Advisory service and the Brewing Industry Research Foundation for co-operation enjoyed in projects of common interest. Indebtedness to growers, factors, merchants and brewers for valuable help in many aspects of the work of the Department is gladly acknowledged.

A feature of the year was a successful conference for hop growers held in the Swanley Hall, Withersdane, on 6th January 1960. A total of 250 growers and other guests (including factors, merchants and brewers) were present, the West Midlands being well represented. The conference was devoted to accounts of hop research in progress at the College and papers were read by Dr. Darling, Mr. Thompson, Dr. Williams, Dr. Coley-Smith and Mr. Farrar; Mr. Bailey of the National Institute of Agricultural Engineering also presented a paper. A full account of this conference is published in the latest Annual Report of the Department. At the request of the National Agricultural Advisory Service, abridged versions of this conference were held in February and March at Bromyard, Herefordshire; at Bentley, Hampshire; and at Goudhurst, Kent. Papers were read at these N.A.A.S. conferences by the members of the Department already mentioned and also by Mr. Neve.

Dr. Williams took part, in January 1960, in the Symposium on the Reproductive Phase in Seed Plants organized by the Linnean Society; in February he read papers at the Symposium on Crop Physiology arranged by the Association of Applied Biologists and at a conference on mist propagation held at the Kent Horticultural Institute. Mr. Roberts read a paper at the meeting of the Plant Phenolics Group held at Birmingham in September 1960.

The Department was active in international aspects of hop

research. In March Mr. Thompson visited Copenhagen for a meeting of the Liaison Committee on which the European Brewery Convention and the European Hops Cultivation Committee are jointly represented. In July Dr. Darling and Mr. Thompson visited Czechoslovakia and read papers at meetings of the Scientific Commission of the E.H.C.C. held in Prague and Zatec. In August the European Hops Cultivation Committee met in full session in London when Dr. Darling presented the report of the Scientific Commission and Mr. Martin read a paper. The E.H.C.C. subsequently visited Wye when accounts of departmental work were given to the 100 delegates and visitors by Mr. Thompson, Mr. Neve and Dr. Williams.

Members of the Department have maintained numerous and helpful contacts with the English Hop Industry. In addition to personal links with many growers, these contacts include official representation on the following committees: the Hops Working Party of the Agricultural Improvement Council, the Farm Advisory Committee of Rosemaund Experimental Husbandry Farm, the New Varieties Committee of the Hops Marketing Board, the Hops Advisory Committee of the Institute of Brewing, the Hops Technical Committee of the Agricultural Research Council and the Working Party set up by the A.R.C. to investigate the problems involved in the safe and economic disposal of wilt-infected waste material from hop picking machines.

Publications

- Beard, F. H. "The Challenge Cups for the New Varieties of hops." *Report of the Department of Hop Research, Wye College, for 1959*, 129.
- Coley-Smith, J. R. "Testing hop varieties for resistance to downy mildew disease, *Pseudoperonospora humuli* (Miy. and Tak.) Wilson. I. Preliminary detached leaf and shoot tests." *Ibid.*, 40.
- Coley-Smith, J. R. "Overwintering of hop downy mildew, *Pseudoperonospora humuli* (Miy. and Tak.) Wilson." *Ibid.*, 107.
- Cripps, E. G. "A note on the boron nutrition of the hop." *Ibid.*, 32.
- Darling, H. S. "Report on experimental work on hops at Rosemaund: a review." *Ibid.*, 140.
- Farrar, R. F. "The seed content of triploid hops." *Ibid.*, 115.
- Thompson, F. C. "Height of wirework and spacing trial No. II: first progress report. Parts 1 and 2." *Ibid.*, 54 and 56.
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- Thompson, F. C. "Notes on recent publications and developments in hop research." *Ibid.*, 144.

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- Weston, E. W. "Methods of analysis for hop resins at Wye College." *Report of the Department of Hop Research, Wye College, for 1959*, 35.
- Williams, I. H., and Farrar, R. F. "Hop propagation, III. The growth of suitable material for the provision of softwood cuttings for mist propagation and the subsequent behaviour of the cuttings in the field." *Ibid.*, 48.
- Williams, I. H. "Height of wirework and spacing trial No. II: first progress report. Part 4." *Ibid.*, 68.
- Williams, I. H. (with Brown, J. F.). "Hop irrigation—progress report." *Ibid.*, 70.
- Williams, I. H. "Changes in the carbohydrate balance of the hop (*Humulus lupulus* L.) in relation to the annual growth cycle in young plants." *Ibid.*, 98.

The following publications refer to work carried out by members of the Department before appointment to the College:

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- Roberts, J. B. (with W. G. C. Forsyth). "The structure of cacao 'leucocyanidin'." *Biochemical Journal*, **74**, 374.
- Roberts, J. B. (with W. G. C. Forsyth and V. C. Quesnel). "Diphenylenedioxide-2,3-quinone: an intermediate in the enzymic oxidation of catechol." *Biochemica et Biophysica Acta*, **37**, 322.
- Williams, I. H. (with J. P. Hudson and A. Cook). "Effects of environment and age on flowering in raspberries." *Proceedings of the Linnean Society*. (In the press.)

THE LIBRARY

The most notable event of the year was the provision of 600 feet of extra shelving in a room formerly used as an office. Although this is not intended to be more than a temporary measure, the College carpenters took great pains with the work and Mr. Foster and his staff are to be congratulated on their excellent workmanship.

Some two-thirds of the periodicals have been moved to these shelves and the remainder re-arranged, allowing for about four years' expansion throughout all sections of the collection. This has temporarily alleviated the shelving crisis and the greater accessibility of the periodicals will be welcomed, particularly by postgraduates and research staff. But the working space for library staff and readers remains as congested as before, and the dispersal of books over a wider area, out of range of supervision, creates further problems in administration.

Discussions continued throughout the year on various proposals for extension, involving detailed planning to scale of three different areas of the College buildings. The final decision to convert the two floors of the East Wing for the use of the Library means that the cramped conditions will have to continue until the Biological Sciences Department can move into its new quarters. Although it is disappointing to have to wait so long, the proposed site is the best that can be found in the present College buildings. The plans include the provision of a much needed reading room for the use of postgraduates, made possible through the generosity of subscribers to the fund opened in memory of Professor Salmon.

It is pleasant to be able to record that there have been no changes in the Library staff this year. The Librarian was invited to be a member of the United Kingdom delegation to the O.E.E.C. Seminar on "Agricultural documentation", held in Stuttgart-Hohenheim in April. Representatives from 13 member countries, with observers from Canada, U.S.A. and various international organizations, discussed ways and means of bringing the results of agricultural research into the purview of farmers throughout Europe. It was a most heartening and stimulating experience to be one of a team which had a considerable contribution to make from our knowledge of the highly-developed advisory, abstracting and library services in this country. The Seminar was followed by the Quinquennial Conference of the International Association of Agricultural Librarians and Documentalists, which the Assistant Librarian also attended. Nearly 100 members were present, representing some 25 countries, and valuable personal contacts were made with colleagues from agricultural institutions from all over the world. The Librarian presided at one of the sessions of the Conference.

During the Summer Term we were asked by the Association of Special Libraries and Information Bureaux to take part in an enquiry into inter-library borrowing. This entailed timing and recording each stage in our procedure over a period of 6 weeks. It is hoped that the investigation into the results from a random

sample of libraries will throw some light on what has become a nation-wide problem, especially for small, isolated libraries such as that of the College.

The rise in external borrowing noted in last year's report has continued, bringing the number of books borrowed to 633 (compared with 476 in 1958/59 and 281 in 1957/58), and these involved 713 requests to other libraries. The number of books lent to outside libraries increased slightly, and internal loans remained about the same as last year, at 4,876. With no new courses to provide for this year, the number of accessions was lower than in 1958/59, with 394 books and about 250 pamphlets, being around the average for previous years. Six new periodicals were subscribed to during the year. The albums of press-cuttings from 1922/23 to 1957/58, which form such a valuable record of College history, were beautifully bound in quarter leather, and a new volume made up to match opens with the Duke of Edinburgh's visit in October 1958.

We would again like to record our thanks to donors of many gifts during the year. Interesting among these were books by past and present members of the College: "English hops glossary" by Mr. Anthony Cronk and "Agriculture and urban growth" by Dr. G. P. Wibberley; also two lovely sets of volumes from Mr. Hart-Synnot: "The handbook of British birds," edited by H. F. Witherby (5 volumes, 1938-41), and an early edition (7 volumes, c. 1860) of "Flowering plants and ferns of Great Britain" by Anne Pratt, given in memory of two fellow students, C. J. Alexander and W. B. Burgess, killed in the First World War. We were also pleased to receive a copy of "The Loganberry" from Mrs. J. H. Logan, Oakland, California; four volumes of the *Farmers' Magazine* from Mr. R. Dockeray to help fill the gap in our set; and 30 volumes of the *Canadian Entomologist* from Mr. George Wishart of the Canadian Department of Agriculture.

Gifts were also received from: Mr. G. P. Askew, Mr. A. Baker, Miss Betty Balmain, Mr. R. Best, Professor W. Holmes, the Principal, Mrs. E. Thomson, the Cambridge Philosophical Society, the Ministry of Agriculture, Fisheries and Food; Fisons Pest Control Ltd., Shell International Chemical Co. Ltd., University of London Library; European Productivity Agency of the O.E.E.C., Netherlands Ministry of Agriculture, Confederation Européenne d'Agriculture; European Association of Animal Production, and the United States Book Exchange.

THE DEMONSTRATION DEPARTMENTS

General

THE COLLEGE FARM

Seldom can an annual farm report have spanned two such contrasting farming years. Whilst the 1959 season was characterized by long dry periods, 1960 was intermittently wet. A wet spring is favourable to the College farm, but once harvesting operations start such weather usually depresses crop yields. This was the case this year with the corn crops, although canning peas yielded extremely well and a fortunate break in the weather allowed 45 acres of Kent Wild White clover seed to be successfully harvested. Fodder crops grew well, and gave an abundance of keep all through the season. Ley establishment was good and the grass fields which were sown in 1959 improved remarkably after a poor start.

Financial Results

The financial results for the year ending the 31st March 1960 showed a considerable increase in profitability over the previous year. Output of sale crops rose by £24 14s. 0d., compared with 1958/1959, to £65 4s. 0d. per acre. The three factors largely responsible for this were the very favourable corn harvesting conditions, the initial undervaluing of the 1959 wheat stocks in store, and an income of £1,092 for grass and clover seed. The gross output per acre from livestock rose from £21 $\frac{3}{4}$ to £25 $\frac{1}{4}$ per acre, largely due to increased milk sales, although the price per gallon was slightly lower. Taking the farm as a whole, net output rose in 1959-1960 to £47 $\frac{1}{4}$ per acre which was £9 $\frac{1}{4}$ more than for the previous year and, although expenditure rose by £2 $\frac{3}{4}$ to £32 $\frac{3}{4}$ per acre, management and investment income rose from £8 to £14 $\frac{1}{2}$ per acre, which represented a return of 27 $\frac{1}{2}$ % on tenants' capital.

Dairy

Milk production showed an increase of 5,944 gallons, mainly due to an increase in cows, although yields per cow also rose. Although the supplementary feeding was heavier than usual last autumn owing to limited grass growth, this was to a certain extent counter-balanced by the fact that cows were turned out to grass as early as 1st March this spring.

In an effort to reduce the risk of hypomagnesaemia, leys to be used for early grazing were dressed with either 8 cwt. per acre of high magnesium low grade slag or 1 $\frac{3}{4}$ cwt. per acre of Magnesite. Potash dressings were withheld until after the first grazing and these

measures, together with the feeding of magnesite fortified concentrate nuts for the first month of grazing, proved successful. Further investigations regarding fertility were carried out which have revealed no mineral imbalance and eliminated the possibility that contagious abortion was present. On expert advice natural service for the time being has been largely replaced by the use of A.I. in the herd, a home-bred Ayrshire bull (Wye Prince William) being used to produce some of the dairy replacements from the higher producing cows. The remainder of the herd and the replacement heifers are being mated with the Sussex bull to produce a limited number of beef crosses for rearing. Surplus calves are being sold in the market. Sixteen cows were used during the winter for an experiment described under the Department of Agriculture report.

Beef Crosses

The comparison between two groups of 7 cattle—Aberdeen Angus $\times$ Ayrshire and Sussex $\times$ Ayrshire—was completed in May when the animals were slaughtered and the carcasses compared. The Aberdeen Angus crosses, which all graded A, had an average liveweight of 826 lb. and killed out at 53.9% to 446 lb. deadweight. The return of £62 11s. 4d. per animal was slightly less than from the Sussex crosses which averaged £66 8s. 1d. The latter were heavier (881 lb. live weight killing out at 54.3% to give an average deadweight of 479 lb.) and, despite the fact that 2 failed to make grade A, the price of 1s. 6d. per lb. live weight and 2s. 9½d. per lb. dead weight was the same as for the Aberdeen Angus crosses. There was no significant difference in the feed consumption between the two groups.

Sheep

During the year the change-over to a Scots Halfbred breeding flock was completed. The last 80 Kent ewes were sold this autumn, and have been replaced by a similar number of Halfbred tegs. It is planned to mate the majority of the Scots Halfbreds with Suffolk rams and to retain 50 ewe lambs of this cross annually to bring into the flock and mate with Dorset Down rams. This plan has been initiated this year and in three years' time the flock should consist of 200 Scots Halfbred ewes, for crossing with Suffolk rams to produce fat lambs and 50 replacement ewe lambs per year, and 200 Suffolk $\times$ Scots Halfbred ewes for crossing with Dorset Downs for fat lamb production. In this way a 400-ewe flock will be maintained by the annual purchase of only 50 sheep—either as lambs or tegs depending on seasonal prices and available keep. The 1960

lambling season was good with early grass growth and no snow. The 299 Halfbred ewes had a lambling percentage of 159 at weaning and for the 90 Kent ewes, which had been cross bred to Suffolk and Dorset Down rams, the percentage was 124. Since keep was short and ewes were flushed with concentrates in autumn 1959 these figures were considered to be fairly satisfactory. They would have been better had it not been for an outbreak of *Pasteurella Pneumonia* in lambs shortly after birth, which caused losses of 30 lambs in one week, after which the trouble cleared up. This disease, which is causing some concern as the incidence is increasing, has this year occurred in sheep of all ages on the College farm.

Cereals

The cereal crop looked very promising in the spring and early summer but poor harvesting weather reduced both yield and quality. $64\frac{1}{4}$ acres of barley averaged $29\frac{1}{2}$ cwt. per acre, though $104\frac{1}{4}$ acres of winter wheat averaged $33\frac{1}{2}$ cwt. per acre, the second highest recorded yield for the College farm. Spring wheat was again disappointing: 12 acres averaged 25 cwt. per acre which confirms the view that on the College farm this crop should be kept to a minimum.

Peas

$68\frac{1}{2}$ acres of peas were grown in 1960, the crop being vined at Silks through a recently-installed pea viner. The contract schedule for planting and vining was adhered to in spite of difficult climatic conditions at times. The average return of £124 16s. 0d. per acre far exceeded expectations, but yields generally have been good and the crop was grown on land that was new to peas. The catch crops of kale, rape and turnips grown after the peas have given valuable autumn keep.

Potatoes

By way of contrast, potatoes appear to have been over-produced in the last two years. Half of the 1959 crop was sold to the Potato Marketing Board, but because of the surplus, they remained in store and were eventually dumped only just in time to make room for the 1960 crop. This has been a bad season for blight, but although the King Edwards in the experimental area are badly affected, the field crop of Majestics appears to be fairly disease free.

Wild White Clover

Two fields were saved for Kent Wild White Clover seed production this year. Church Field was taken for the second year running

and the clover experiments were repeated on a fresh area of this field. Orchard Field was taken for the first time and the whole area (38 acres excluding the experiment) averaged 103 lb. of clover and 161 lb. of rye grass seed per acre. It is interesting to note that the new ley yielded 87 lb. more clover seed than where seed was grown twice, but the quality of both samples was very good and was sold for 15s. a lb.

Buildings and Fieldwork

Farm building activities have been confined to maintenance work apart from the erection of new concrete sides in the dairy silo. A large repair and painting programme has been carried out at the dairy and new iron gates have been erected. The installation of the pea viner at Silks and the repair of the potato shed at Coldharbour were also undertaken. A certain amount of drainage work and earth moving was involved in incorporating the cricket field with its surrounding paddocks into the farm, and the erection of new fences and hedge planting continues. A rather pressing problem is the efficient disposal of pea effluent from Silks which caused considerable difficulty during harvesting operations. This will have to be solved before next year's pea crop is dealt with.

THE HORTICULTURAL SECTIONS

The financial year 1959 was the most successful the Department of Horticulture had achieved for some time, and this was owing to the fact that all of its commercial sections made an effective contribution. The summer was one of the driest on record and a soil moisture deficit of 10 inches was reported in the fruit plantations. Despite the drought, and long hours of sunshine and high temperatures, the College fruit crops responded well and the ready sale of good quality produce greatly encouraged the staff. The crop weights from soft fruits, some 46·8 tons, and about 7,500 bushels of apples and pears were highly commendable. Unfortunately, high cash returns do not always follow high yields. The contract price of blackcurrants fell by £40 per ton and the finish of the pear crop was not up to expectation, due directly to the drought. Despite the fairly satisfactory financial position as regards the fruit section over the past few years, it is still relatively unstable owing to the reliance that has been placed on the soft fruit crops. In these circumstances gluts or adverse weather easily involve the Department in serious losses. It is recognized that a reasonable measure of stability cannot be achieved until the income from the top fruit,

on the basis of a five-year average, is equal to the total annual expenditure on the fruit section. At present a high proportion of the acreage is maintained in soft fruit, as an interim measure, while planting of new and well designed orchards of dessert apples and pears proceeds. It will still be another 5-7 years before a soundly balanced section is achieved.

During the winter $4\frac{1}{2}$ acres each of strawberries and raspberries were planted to ensure a succession of areas under these fruits. The raspberries are planned as a monoculture, but the strawberries will be overplanted with dessert apples in the autumn of 1962. The old orchards of Newton Wonder apples and Conference pears planted in 1913 and well known to many generations of Wye students were grubbed during the winter.

In the Market Garden section there has been a further reduction in the area devoted to seed crops and except for a few small patches conveniently cropped with flowers for seed, only the cauliflower var. "All the Year Round" as an out-of-doors crop and tomato for hybrid seed are now retained. It is worthy of note that the staff are now highly skilled in the detail of F_1 hybrid seed growing of tomatoes and the satisfactory returns have justified the retention of this project. The lettuce crops, both protected and out-of-doors, have been much less satisfactory over the last three or four years, so production is now limited to the protected spring crop. Cold-house tomatoes continue to be the most important summer crop, and the high yield, approximately 45 tons per acre in 1959, is considered good by any standards. The variety "Dutch Victory" is still the best tomato variety for the climatic and soil conditions at Wye.

The College policy of withdrawing, gradually, the traditional type of heated glasshouses from commercial production, as they are required for research purposes, is to be compensated by the extension of the facilities for protected cultivation. The Department therefore envisages considerable expansion of its area under mobile glass and as a first step a $\frac{1}{4}$ -acre "Alumabrite" house has been purchased for this purpose.

The Decorative Gardens

In the autumn of 1959 Mr. Sheppard and his staff reconstructed the rock-bank which was badly overgrown. Using a pleasing Kentish ragstone for the erection of two terraces, an attractive site has been prepared and planted with an interesting selection of rock garden and alpine plants.

An example of formal bedding was included in the Withersdane gardens to replace the former annual beds that had never been

very satisfactory; their innovation caused much interest and discussion between opposing schools of thought. The annual beds found an attractive home in the little area enclosed by the *Lonicera* hedge and produced a most attractive display upon which visitors commented most favourably.

The border in front of the new buildings has filled up at an amazing speed and is now so lush that it will shortly need replanting and will need very careful planning. Our shrubs were magnificent during 1960, following the favourable summer of 1959, and many of the rarer species and varieties attracted attention. It was a great pleasure to see *Sophora tetraptera*, *Holboellia latifolia* and *Azara microphylla* flowering at Wye.

APPENDICES

I

ACADEMIC AND ADMINISTRATIVE STAFF

Resignations during the year:

- E. G. Cripps, M.Sc.(Lond.), A.I.C.T.A., Experimental Officer in Hop Research Department.
J. B. Dalrymple, B.Sc.(Sheff.), M.Sc.(Lond.), Assistant Lecturer in Department of Physical Sciences.
Elizabeth Emmerson, B.Sc.Hort.(Lond.), Demonstrator in Department of Horticulture.
W. L. Hinton, B.A.Comm.(Manc.), N.D.A., Lecturer in Department of Agricultural Economics.
R. G. Milne, B.A.(Cantab.), Assistant Lecturer in Department of Biological Sciences.
P. C. J. Payne, M.Sc., Lecturer in Department of Agriculture.
Anne Rogers, B.Sc.(Hull), Demonstrator in Department of Biological Sciences.
J. T. Ward, B.Sc.Econ. (Lond.), B.Litt.(Oxon.), Lecturer in Department of Agricultural Economics.

Promotions confirmed during the year:

- G. J. Tyler, B.Sc.Agric.(Lond.), from Assistant Lecturer to Lecturer Grade B.

Appointments during the year:

- J. L. Garraway, B.Sc.(Lond.), Assistant Lecturer in Department of Physical Sciences.
T. A. Hill, B.A.(Cantab.), Demonstrator in Department of Biological Sciences.
J. B. Roberts, M.Sc.(Sheff.), Scientific Officer in Hop Research Department.
Anne Rogers, B.Sc.(Hull), Demonstrator in Department of Biological Sciences.
K. Rothwell, B.Sc.(Hull), Ph.D.(Lond.), Scientific Officer, Agricultural Research Council Unit.
P. P. Rutherford, B.A.(Cantab.), Ph.D.(Dublin), Assistant Lecturer in Department of Physical Sciences.

SECRETARIES OF COLLEGE COMMITTEES

Secretary of Academic Board	C. W. A. Garland
Secretary of Board of Studies	A. A. Jackson
Secretary of Research Colloquia	J. E. Duckworth

ELECTED OFFICIALS OF THE COLLEGE

President of the Senior Common Room	I. G. Reid
Steward of the Senior Common Room	I. H. Williams

OFFICIALS OF THE STUDENT UNION SOCIETY

<i>Patrons</i>	The Principal
	The Vice-Principal
<i>Trustees</i>	The Patrons
	The College Warden
<i>Senior Treasurer</i>	C. W. A. Garland
<i>President</i>	D. A. Allison
<i>Vice-President</i>	Susan Cornwell
<i>Secretary</i>	M. J. F. Pash
<i>Junior Treasurer</i>	M. J. G. Tapp

II

THE STUDENT BODY

	1959/60	1958/59
<i>Total Student Body</i>	243*	229†
Men	201	184
Women	42	45
<i>Reading for 1st Degrees in Agriculture</i>		
Honours Degree: Men	45	46
Women	4	5
	— 49	— 51
General Degree: Men	90	81
Women	11	11
	— 101	— 92
	—	—
Total	150	143
<i>Reading for 1st Degrees in Horticulture</i>		
General Degree: Men	33	35
Women	24	27
	—	—
	57	62
<i>Reading for Postgraduate Degrees</i>		
Men	33	22
Women	3	2
	—	—
	36	24

* Includes one student reading for General degree in Agriculture who withdrew during the session, one postgraduate student who withdrew during the session, and three postgraduate students on temporary secondment to the College.

† Includes two students reading for General degree in Agriculture and one reading for degree in Horticulture who withdrew during the session.

III

EXAMINATION RESULTS—JULY 1960

FIRST AND SECOND YEAR EXAMINATIONS

	<i>Passed</i>	<i>Referred (or Pass in one Section)</i>	<i>Com- pleted Exam- ination by Passing in one Section</i>	<i>Failed</i>	<i>Total Candi- dates</i>
<i>Agriculture (Honours) Degree</i>					
Part I	16	2	1	2	21
Part II	6	—	—	5	11
<i>Agriculture and Horti- culture (General) Degree</i>					
First Examination	38	9	12	14	73

FINAL EXAMINATIONS

	<i>Passed</i>	<i>Failed</i>
<i>Agriculture (Honours) Degree</i>		
1st Class Honours	1	
2nd Class Honours:		
Upper Division	2	
Lower Division	7	
Pass	2	
	—	12
<i>Agriculture (General) Degree</i>		
First Division	1	
Second Division	14	
Third Division	13	
	—	28
<i>Horticulture (General) Degree</i>		
First Division	4	
Second Division	8	
Third Division	5	
	—	17

IV

DEGREES CONFERRED BY THE UNIVERSITY DURING THE YEAR 1959-60

Awarded the B.Sc. Degree in Agriculture with Honours

<i>First Class</i>	<i>Second Class</i> <i>(Upper Division)</i>	<i>Pass</i>
Gaunt, John	Wells, Richard	Barnes, John
Langlands, James	<i>(Lower Division)</i>	Baxter, Robert
	Broadbelt, Roger	Dent, Timothy
	Coley, Richard	England, Peter
	Thompson, Michael	May, John
	Vale, Brian	
	Willmott, Jane	

Awarded the B.Sc. Degree in Agriculture

<i>First Division</i>	<i>Second Division</i>	<i>Third Division</i>
Nowell, Andrew	Bailey, Simon	Buckley, William
	Catling, Jennifer	Green, Derek
	Clarke, Frederick	Latham, Paul
	Ewing, Colin	Mackenzie, Robin
	Field, David	Moore, Robin
	Gowen, Brian	Reeve, Alan
	Jacot, Guy	Sampson, John
	Sole, Francis	Wilkins, Avril
	Somerville, Timothy	
	Wilmott, Lorna	
	Wishart, Luke	
	Wood, Jane	
	Wood, John	

Awarded the B.Sc. Degree in Horticulture

<i>First Division</i>	<i>Second Division</i>	<i>Third Division</i>
Bartlett, Cyril	Caseley, John	Bagnall, Robert
Everitt, Martin	Cooper, Elizabeth	Brogan, Gillian
Howard, Brian	Medd, Margaret	Hart, David
Macdonald, Lesley	Parker, John	Stephens, Sheila
Somerville, Christina	Price, Ian	
	Rankin, Ennid	
	Vinson, James	
	Williams, Rosslyn	

HIGHER DEGREES

Awarded Ph.D.

Brierley, Malcolm	(1957-1960)
Dye, Murray	(1957-1959)
Simpson, Graham	(1956-1959)
Ward, John	Staff (1954-1960)

Awarded M.Sc.

Beresford, Stewart	(1958-1960)
Byng, Albert	(1958-1960)
Festing, Michael	(1958-1960)
Holt, James	(1958-1960)
Howe, Patricia	(1958-1960)
Hunton, Peter	(1958-1960)
Khattab, Abdel	(1958-1960)
Lee, Philip	(1955-1960)
Rowe, Alan	Staff (1953-1958)
Sharp, Keith	(1958-1960)
Thomas, Graham	(1954-1959)
Thompson, Peter	(1955-1960)

POSTGRADUATE SCHOLARSHIPS AWARDED AT THE END OF SESSION 1959-60

Scholarships awarded to students of the College

<i>Name</i>	<i>Awarding Body</i>	<i>Tenure</i>
Bould, Aubrey	Ministry of Agriculture	Wye College
Bullock, Steven	„ „	Leeds University
Clark, Michael	Cornell University	Cornell University
Drake, Kenneth	Ministry of Agriculture	Nottingham University
Gasson, Ruth	„ „	Oxford University
Hide, Geoffrey	„ „	Wye College
Jones, Pauline	„ „	Imperial College

Scholarships tenable at Wye College awarded to students from elsewhere

<i>Name</i>		<i>Awarding Body</i>
Abaelu, John	University College, Ibadan	Leverhulme Research Award
Atkin, Roger	Cambridge University	May & Baker Research Award
Frost, Brian	Edinburgh University	Department of Agri- culture, Scotland
Garner, John	Nottingham University	British Egg Marketing Board
Griffiths, Carl	Leeds University	May & Baker Research Award
Smithson, John	Durham University	Guinness Postgraduate Award
Spencer, James	University College of Wales	British Egg Marketing Board
Westley, Josephine	Polytechnic, London	Ministry of Agriculture

V

COLLEGE SCHOLARSHIP AWARDS

The Paton Figgis Scholarship
William Hill

The Women's Land Army Scholarship and Bawden Fund
Susan Cornwell

PRIZE AWARDS

The Harwood Memorial Medal and Prize
John McInerney

The Hughes Memorial Prize
John Bennett

The Mary Bond Prize
Beryl Nowell

The Monica Franklin Prize
Margaret Ashworth

The Bell Bequest
Michael Festing

Fruiterers' Company Medal

John Turpin

Gardeners' Company Prize Award

Peter Newell

Farmers' Company Medal

John McInerney

Agricola Club Prize

Martin Hooper

The Millers' Mutual Association Prize

John Crowther

The Landsman's Library Prize

John Bennett

British Oil and Cake Mills Ltd. Essay Prize

No award recommended.

Spillers Ltd. Prize

John English

VI

STUDENTS ADMITTED TO THE COLLEGE SESSION 1959-1960

<i>Postgraduates</i>	<i>University</i>
Barr, Donald	Liverpool
Evans, Albert	Wales
Halliwell, Peter	Newcastle
El Hossery, Mohamed	Cairo
Islam, Shamsul	Manchester
Martin, David	Reading
Sid Ahmed, El Sayed	Cairo
Waring, Frederic	Wales

Wye College graduates re-admitted to postgraduate study

Howard, Brian

Mackenzie, Robin

Macdonald, Lesley

Wells, Richard

*Undergraduates**School*

Almond, George
Anderson, John

Oundle School
Gordonstoun School

Ball, Alan
Barker, Terence
Barnett, Peter
Brewster, Billie-Dawn
Brook, C. Edward
Brown, K. Martin
Buckingham, Michael
Burrows, John

Purley County Grammar School
Blundell's School, Tiverton
Oakham School, Rutland
Dartford Grammar School
Canford School, Wimborne
Norwich City College
Wellington College
Rossall School, Fleetwood

Chandler, Bernard
Charlton, Randal
Churchill, Penelope
Cook, David
Cox, Bruce
Cropper, William
Curle, Christian
Currah, Ian
Curtis, John

Enfield Grammar School
Mill Hill School
Charlton Park Convent School
Westminster City School
Hitchin Boys' Grammar School
Ormskirk Grammar School
Wycombe Abbey School
Goudhurst School
Taunton School

Darlow, Anne
Davies, Eric
Davis, Michael
Davis, Susan
Drake-Lee, Terence
Dutton, David

Roedean School, Brighton
Birkenhead School
University College School, London
Westcliff High School
Stonyhurst College, Lancashire
Wellington College

English, John

Norwich School

Folland, Basil
Fuller, Michael
Furieux, Colin

Queen Elizabeth's School, Crediton
Framlingham College
Sutton Valence School

Gaze, Richard
Gregory, N. Hugh
Gwyer, George

Glyn County Grammar School, Epsom
Millfield School, Somerset
Wimbledon College

Hall, Richard
Harding, Pauline
Harries, Hugh
Henley, Janet
Humphries, David
Humphrey, John

Northgate Grammar School, Ipswich
Brighton Technical College
Simon Langton School, Canterbury
Bridlington High School
Beckenham & Penge Grammar School
Merchant Taylors' School, Northwood

Ivory, Michael	Bedford Modern School
James, Robert	Dulwich College
Jones, Peter	King's College School, Wimbledon
Lake, Roger	Taunton School
Lanksheer, John	St. John's School, Leatherhead
Leonard, Patrick	Battle Court, Eastbourne
Lugg, David	Truro School
McHugh, Denis	Downside School, Royal Veterinary College
McIntyre, Donald	St. George's College, Argentina
Macklin, Michael	St. Albans County Grammar School
Maclean, Adrian	Radley College
Mantle, Geoffrey	King Edward VI School, Lichfield
Margetson, Franklin	Westminster College of Commerce
Massey, John	Ampleforth College, York
Maundrell, Robert	Bryanston School
Mitchell, Mary	Sherborne Girls' School
Newell, Peter	Kent College, Canterbury
Norris, J. Michael	Liverpool Institute High School
O'Connell, Richard	Queen Elizabeth's School, Barnet
Paul, George	Harrow School
Purvis, Malcolm	Charterhouse School
Read, Barbara	South Hampstead High School
Reffell, Graham	Reigate Grammar School
Scopes, Nigel	Ardingly College
Scully, Sean	Hurstpierpoint College
Simmonds, Peter	Harrow School
Smith, Anthony	Whitgift School, South Croydon
Speyer, Paul	Millfield School, Somerset
Spriggs, Daphne	Stratton School, Bedfordshire
Stewart, Lewis	St. Lawrence College, Ramsgate
Tabram, John	Oakham School, Rutland
Vine, Brian	Houghton-le-Spring Grammar School
Virgo, Keith	Bedford School
Warren, Brian	King's School, Bruton
Wilson, Richard	Hurstpierpoint College
Worlock, Peter	Foys, Chetnole, Sherborne
Wright, Pauline	St. Martin-in-the-Fields School, London

VII

STUDENT CLUBS AND SOCIETIES

Clubs

Rugger	Athletics
Soccer	Cross Country
Hockey (Men)	Squash
Hockey (Women)	Badminton
Cricket	Ploughing
Tennis	Wye College Beagles
Rifle	Chess
Fencing	Swimming

Societies

Music	Dramatic
Debating	Natural History
Archaeological	Christian Fellowship
Dancing	Photographic
Scientific	International Student Exchange
Exploration	United Nations Student Association

VIII

BENEFACTIONS

From the Worshipful Company of Gardeners, £200 towards a Postgraduate Scholarship tenable at the College.

From the Worshipful Company of Gardeners a College Prize, £5 5s.

From the Worshipful Company of Fruiterers, a medal for a College Prize.

From the Worshipful Company of Farmers, a prize Gold Medal and Certificate.

From Messrs. May & Baker Ltd., a renewal of the Research Fellowship, £750.

From Messrs. Fison's Ltd., a renewal of the three-year research fellowship in Biology, £750.

From the Shell Petroleum Co. Ltd., a renewal of the research grant for a further year, £500.

From Messrs. Arthur Guinness, Son & Co. Ltd., a renewal of the general grant for a further year, £50.

From the Millers' Mutual Association for a College Prize, £4.

From the Landsman's Library, a prize award of books to the value of £2.

A Bequest under the Will of Miss Lucy Kemp-Welch, a portrait of John (Kemp) Archbishop of Canterbury and Cardinal, painted by her sister, Miss Edith Kemp-Welch.

From J. W. Kennard, Esq., Clerk to the Governing Body of the College, an oak side-table for use in the College Chapel.

From Messrs. Pfizer Ltd., £500 to aid in the building and equipping of an experimental broiler house.

From the Rockefeller Foundation, \$U.S. 7,200 for the purchase of research equipment in the Department of Biological Sciences.

From the Kent Farmers' Union, £200 to assist in the research work being carried out at the College on the production of Wild White Clover Seed.

From Miss Maplesden Noakes, M.B.E., a member of the Governing Body of the College, a pair of blue and white Oriental flask vases.

From L. E. Knollys, Esq., a silver tankard.

From Colonel the Honourable Ian Campbell, G. H. Garrad, Esq., Sir Edward Hardy, R. Hart-Synnot, Esq., Captain W. McGowan, and Lieutenant-Colonel A. V. Spencer, a silver tankard.

From F. Blest, Esq., A. M. Downton, Esq., R. Hart-Synnot, Esq., W. N. Harvey, Esq., R. P. Pierce, Esq., and R. Wellington, Esq., a silver tankard.

IX

PUBLIC SUBSCRIPTION CONCERTS

(The National Federation of Music Societies, to which the Wye College Music Club is affiliated, supports its concerts with funds provided by the Arts Council of Great Britain)

25th October 1959	The London Orpheus Choir
22nd November 1959	The London Recital Group
31st January 1960	Intimate Opera: "Thomas and Sally" and "Three's Company"
6th March 1960	Elizabeth Harding—Piano Daphne Down—Clarinet Elizabeth Hawes—Mezzo-Soprano

PUBLIC ART EXHIBITIONS

An exhibition of paintings, drawings and other work by Gordon Davies, A.R.C.A., and John Ward, A.R.A.

X

COLLEGE LECTURES

Autumn Term

- Dr. A. L. Rowse, M.A., D.Litt.
"Elizabethan England and Today"
Jeremy Warburg, Esq., M.A., A.M.
"Language and Communication Research"
E. M. H. Lloyd, Esq., C.B., C.M.G.
"European Economic Integration"

Spring Term

- Miss S. Crowe, P.I.L.A.
"Landscape in an Industrial Age"
Professor M. M. Swann, M.A., Ph.D.
"New Light on Growth"

XI

RESIDENTIAL CONFERENCES AND COURSES HELD AT THE COLLEGE 1959-60

				<i>Approx. Nos. Attending</i>
25th March—27th March 1960				
Business and Professional Women	..	..		125
8th July—9th July				
International Grassland Congress	..	..		27
20th August—3rd September				
University Summer School	..	..	..	155
5th September—9th September				
Chick Producers' Association	..	..	..	66
12th September—14th September				
Advisory Bacteriologists	..	..	..	25
16th September—18th September				
Small Scale Horticulture—University Department of Extra Mural Studies	..	..	..	80
23rd September—25th September				
Agricola Club Week-end	..	..	..	140



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